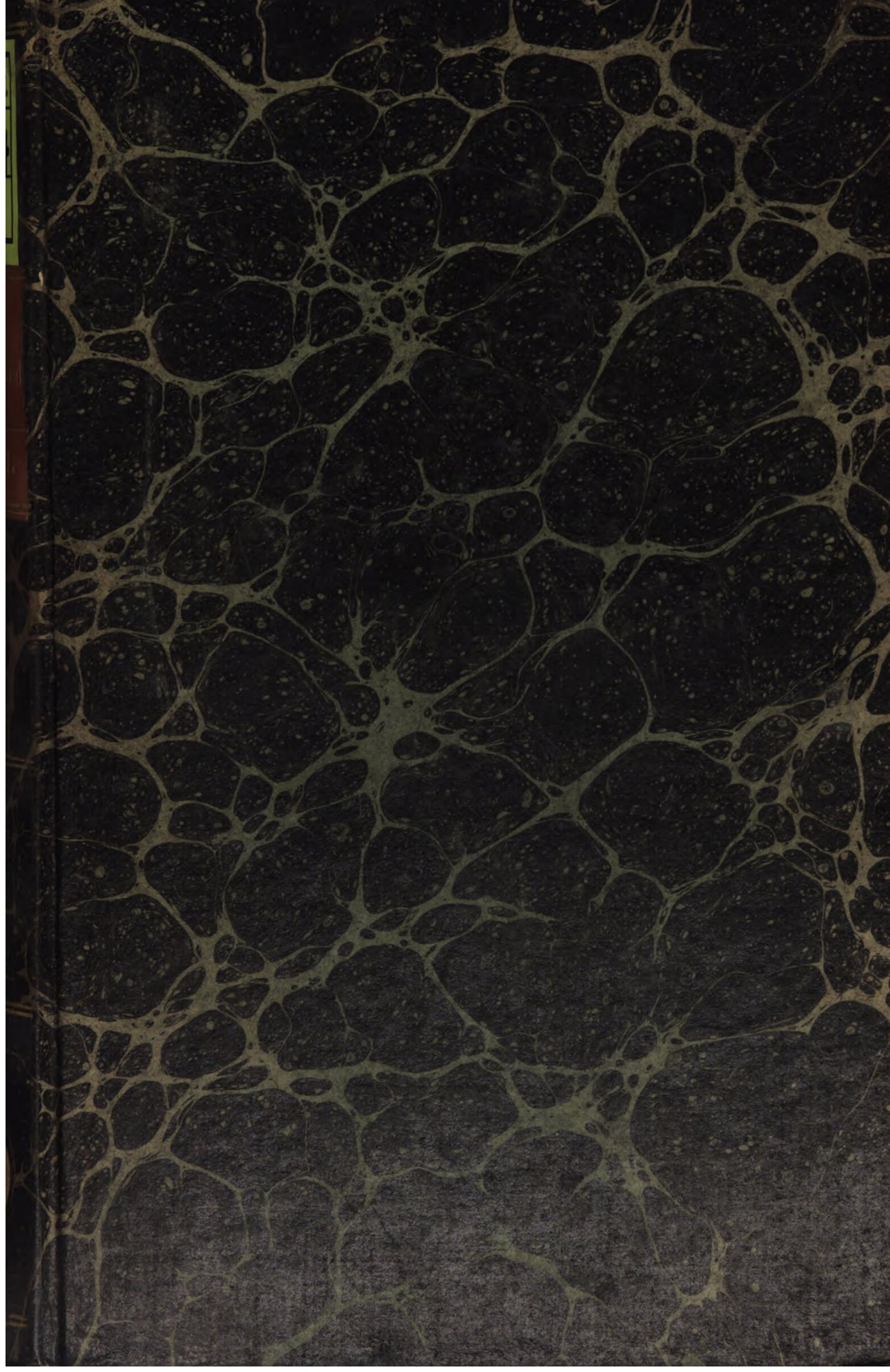




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TRAVELS
IN
SWITZERLAND,

AND IN THE
COUNTRY OF THE GRISONS:
IN A SERIES OF LETTERS TO *WILLIAM MELMOTH*, Esq.
FROM
WILLIAM COXE,
M. A. F. R. S. F. A. S.

To which are added the Notes and Observations of
Mr. RAMOND, translated from the French.

A NEW EDITION

Embellished with a large new Map, and six Views
drawn by BIRMANN and engraved under his direction.

VOL. II.

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1802.

Nature! great parent! whose unceasing hand
Rolls round the seasons of the changeful year,
How mighty, how majestic are thy works!
With what a pleasing dread they swell the soul!

THOMSON'S SEASONS. Winter, Ver. 105.

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München

T O

HENRY WILLIAM PORTMAN, Esq.

OF BRYANSTON, DORSETSHIRE,

THIS THIRD VOLUME OF

TRAVELS INTO SWITZERLAND

IS INSCRIBED,

AS A TESTIMONY OF ESTEEM AND GRATITUDE,

BY HIS

OBEDIENT,

AND OBLIGED,

HUMBLE SERVANT,

WM COXE.

HENRY WILLIAM PORTMAN, ESQ.

OF THE BARRISTERS AT LAW,

THIS THIRD VOLUME OF

TRAVELS INTO SWITZERLAND

IS DESCRIBED,

AS A TESTIMONY OF FIDELITY AND GRATEFULNESS,

BY HIS

GRANDFATHER,

AND GRANDMOTHER,

MURIELLE PORTMAN,

WM COX

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T O

SAMUEL WHITBREAD, Esq. M. P.

S I R,

AS the opportunity of reviving and augmenting this part of my Letters on Switzerland, and of rendering them more worthy of public inspection, was entirely owing to the honor of accompanying your Son upon his Travels, to you I beg leave to inscribe this Second Volume, as a public mark of that esteem and regard, with which I am,

S I R,

Your most obedient,

and obliged humble servant,

WM COXE.

WILLIAM WILKINSON, Esq. M. P.

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amending this part of my Essay on
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Sir,
Your most obedient,
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WM COXE

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LETTERS, &c.

LETTER 30.

Valley of the Aar—Land of Hasli—Meyringen.

August, 1776.

I FOUND the cold upon the Grimsel more piercing than upon the St. Gothard; and last night it even deprived me of my sleep. But then circumstances were very different in the two lodgings: for on the St. Gothard I had a comfortable bed; whereas, last night, I lay in the hay-loft, without any covering: I declare, my blood has scarcely recovered its circulation. Take notice this is the twelfth of August.

Having quitted our wretched abode on the Grimsel, we passed along the valley of the Aar, through an uninterrupted chain of wild, rugged, and uninhabitable alps¹.

The road along this valley, though much narrower than that from Altorf to the St. Gothard, is formed in the same manner along the steep acclivities and declivities, sometimes laid on arches, and sometimes carried over bridges thrown across the tremendous precipices. It is paved with flat pieces of granite, so smooth and slippery, that the horses would have perpetually stumbled, if they

¹ Mr. Coxé bestows the denomination of *Alps* indiscriminately on all the mountains in Switzerland; whereas the inhabitants give this name only to those of the first class.

RAMOND.

had not been rough-shod. In some parts this road ran along the bare and rugged ridges; in others, down steps, either cut in the rock, or formed by large stones, so that for several paces it resembled a staircase. The whole surface of the valley was thickly strewn with vast fragments of rock; while those, which still hung on the sides of the mountains, seemed threatening to overwhelm us; the river, during the whole way, thundering along in a continual fall. This valley exhibits the same kind of scenes to which we have been long accustomed; except that the Aar rushes with more impetuous rage even than the Rhone or the Reuss, and is frequently so swelled with the torrents it receives in its course, as to ravage all the adjacent country: we saw many marks of these terrible devastations. We crossed it in several places, over stone bridges of a single arch, one of which equalled, in the length of its span and dreariness of the landscape, the Devil's Bridge in the valley of Schoellenen. About three leagues from Spital, we had a glimpse, through the trees, of the Aar falling from a considerable height. In order to gain a nearer view, we climbed along the sides of a steep rock, well covered with moss: I leaned against a tree that impended over the precipice, and saw the river rushing from the rock, and spreading into a kind of semicircular expansion in its descent. It fell with fury into a deep and narrow gulf, and then lost itself in the midst of the forest. The body of water was very considerable, and its perpendicular fall, as far as I could judge by the eye, at least one hundred and fifty feet. The scenery also was solemnly majestic; the grey rocks on each side rising perpendicularly, and

totally bare, except their tops, which were fringed with pines.

This picturesque scene appeared to realize a favorite image of classic antiquity : as I viewed the Aar pouring its flood of waters from a crevice of the rock, I figured to myself the Nile or the Tiber bursting at once from the urn of a River-God.

In our way to Meyringen, we traversed large forests of beech and pines, the Aar roaring along the valley, and the road, which was as craggy and rugged as usual, incessantly ascending and descending. We now passed through several small villages, which afforded a pleasing sight, after the desolate country we had so lately quitted; and entered a beautiful little valley of a most lively verdure, and delightfully planted. All was calmness and repose : neither rapid river nor roaring torrent to interrupt the unusual stillness and tranquillity of the scene. This short interval of silence, rendered us more sensibly affected with the turbulence of the Aar and the loud clamor of the cataracts.

From this silent and sequestered spot, we descended to a larger valley on the banks of the Aar. Perhaps no other part of Switzerland would yield more delight and occupation to the landscape-painter than this picturesque valley, from the agreeable and ever-changing color of the rocks which bound it, their summits finely broken into irregular and fantastic forms, and from the variety and size of the fragments dispersed near the banks of the river. Each fragment, each cottage, each shed, and each shrub, is a picture; the effect being considerably heightened by the transparency of the air, and the greatness of the back-ground.

We have now visited the sources of three great rivers in Switzerland, and have traced their impetuous progress through a tract of country, in which nature has exhibited the grandest and most august of her works. But how impossible have I found it to lay before you adequate descriptions of these majestic, variegated, and astonishing scenes! They must all of them upon paper necessarily appear much the same: yet, in fact, every river and cataract, every rock, mountain, and precipice, are respectively distinguished by an infinite diversity of modifications, and by all the possible forms of beauty, or magnificence; of sublimity, or horror. But these discriminating variations, though too visibly marked to escape even the least observing eye, elude every kind of representation, and defy the strongest powers both of the pen and the pencil. In a word, you must not judge of this romantic country, from the faint sketches I have attempted to delineate: for, upon the whole, they can no more convey an idea of these wonderful scenes, than if I were to aim at giving some notion of the pictures of Raphael and Correggio, by informing you, that they are composed of paint and canvass.

Meyringen, a large and neat village, is the capital burgh of Hasliland, a district in the canton of Berne, which enjoys considerable privileges. The people are governed by their own magistrates, and only take oaths of fidelity to the Sovereign Council of Berne. All the authority, which the bailiffs in the other parts of this canton enjoy, is possessed in a great measure by the Landamman; who resides at Meyringen. He is always a native of Hasliland, and is appointed by the Sovereign

Council of Berne, at the recommendation of the bailif of Interlaken. Most of the other magistrates are elected by the people, who assemble as occasion requires, and are convoked by the Landamman.

The inhabitants are a fine race of people: the men in general remarkably strong and well made; the women tall and handsome. The latter have an elegant manner of wearing their hair, which is commonly of a beautiful brown: it is parted from the top of the forehead, from thence brought round and joined to the locks behind, which either hang down their back in long tresses, are braided with ribband, or woven round the head in a simple plait. But the other part of the dress does not in the least correspond with this elegance; as their shapes, naturally fine, are spoiled by an absurd fashion of wearing their petticoats so high, that they all appear as if they were far advanced in pregnancy.

Meyringen is situated near the Aar, in a very romantic vale; surrounded by meadows of a most luxuriant verdure, and sprinkled with cottages; which are occasionally separated from each other by huge intervening stones and deep channels, the remaining effects of storms and inundations. Close to the village, the Alp-bach, a torrent so called, falls from mount Housli, in two perpendicular cascades, but with so much violence, and in so large a body of water, as to cause frequent inundations: indeed the burgh itself has been in danger of being overwhelmed and destroyed by its repeated ravages; against which, however, it is now protected, by a wall of considerable height and solidity. Near this torrent another fall of water, called the Dorf-bach, glides gently down the bare

rock; and further on, the Millebach glistened as it descended through a hanging grove of pines, that feather the sides of the mountain.

As I stood on a platform of rock, about fifty feet above the bottom of the Alpbach, I looked over the delightful vale of Hasli, observed Mount Scheidec rising from the banks of the Aar, and lowering in one part, as if on purpose to discover three tremendous peaks, in regular gradation one above the other; the one a naked conical rock; the second more tapering and sprinkled with snow; and the third, which is the highest point of the Wetterhorn, of a pyramidal form, mantled with glistening ice.

The following is the ordinary price of provisions throughout the mountainous parts of Switzerland. ²

				s.	d.
Butcher's meat, <i>per</i> pound	—	—	—	0	2 $\frac{1}{2}$
Bread	—	D°	—	0	1 $\frac{1}{2}$
Butter	—	D°	—	0	2 $\frac{3}{4}$
Cheese	—	D°	—	0	2 $\frac{1}{2}$
Salt, <i>per</i> pound	—	—	—	0	1 $\frac{1}{2}$
Milk, <i>per</i> quart	—	—	—	0	1 $\frac{1}{2}$
Worst wine, <i>per</i> D°	—	—	—	0	1 $\frac{1}{2}$
Pays de Vaud wine	—	—	—	0	6

² The reader will recollect, that this list was taken in 1776, since which time the price of provisions is considerably augmented.

By this list you will perceive, that, in proportion, bread is much dearer than the other articles; and the reason is obvious: for these mountainous parts consist almost entirely of pasturages, and produce little corn. The peasants, inhabiting the mountainous districts of Switzerland, live chiefly upon milk and potatoes, which are here much cultivated. According to the price of provisions in England, the above list will appear exceedingly reasonable: but then it ought at the same time to be considered, that money is very scarce in these parts. Nor indeed is it so much necessary in a country, where there is no luxury, where all the peasantry are tolerably well provided with every necessary of life from their own little domains. I had, to-day, a long conversation with one of the lads who accompanied us from Altorf, and who takes care of our horses. He lives upon the mountains of Uri; and, as the winter lasts near eight months, during some part of which time there can be little communication between the several cottages, every family lays in sufficient provision for the whole winter. His own family consists of seven persons, and is provided with the following stores: seven cheeses, each weighing twenty-five pounds; a hundred and eight pounds of hard bread, twenty-five baskets of potatoes, each weighing about forty pounds; seven goats, and three cows, one of which is killed. The cows and horses are fed with hay, and the goats with the boughs of firs; which, in a scarcity of fodder, are given also to the other cattle. During this dreary season, the family are employed in making linen and cloth: and, for this purpose, a small part of the ground

belonging to each cottage, is generally sown with flax. That plant has lately been much cultivated, and with increasing success, in the mountainous districts of Switzerland.

The houses, like those of Appenzel and Glaris, are generally of wood; and it was a natural observation of one of our servants, in passing through a continued chain of rocks, that, as there was no deficiency of stone, it seemed extraordinary, wood alone should be employed for the purposes of building. But it may be remarked, that these wooden houses are sooner constructed, and easily repaired; and being formed in a compact manner, with small rooms, and low ceilings, are sufficiently warm even for so cold a climate. The chief objection to them arises from the danger of fire; which, however, is in some measure obviated by the method of building their cottages detached from each other. But this observation does not hold with respect to some of their largest burghs: which must consequently be exposed to the ravages of this dreadful calamity.

I am, &c.

Part of the Translator's Journey.

Of the different roads which lead into the upper part of the *Hasliland* that by the valley of *Engelberg* is the most romantic. I undertook it in a year, when the snow lay very deep, and at a season which was rather too early to venture into the higher Alps.

I set out from *Lucerne*, where general *Pfiffer* had received me with his usual kindness. This gentleman's knowledge and obliging behaviour render his house an interesting object to travellers that visit this country. I had beheld with astonishment on his curious model every wonder which the interior

parts of Switzerland had already displayed to me, and those I had yet to wander over. Mr. Pfiffer knew my way of travelling, and thinking me worthy to visit the higher Alps, pointed out to me a route, whereof the *Hasliland* was to be the first stage.

Having sent a servant with our luggage to wait for us at *Berne*, we took the most necessary articles into our pockets, and with staves in our hands, my companion and I marched forth with the spirit and the carelessness of people that have neither attendants nor equipage.

This method of travelling had been recommended to us by general Pfiffer, as the most proper for acquiring a knowledge of the country and getting acquainted with the manners of its proud, yet simple inhabitants.

We crossed the lake of *Lucerne* in what they call here an *Eichbaum*, a kind of canoe made of the trunk of a tree, in which we were compelled, by the swell of the water, to lie down, as by the least motion our boat would have been overset.

Landing at *Stanzstadt*, we passed by *Stanz*, the capital of *Unterwalden*, and continued our route through a fine valley besprinkled with cottages, surrounded by their pasture-grounds and embosomed in trees. The cattle, which waited for the season to mount into the higher Alps were feeding in these parks and covered their wide surface. Earth and man seem here created merely for the sake of these animals, and every thing suited to their wants and conveniency. Pasturages are very extensive and cornfields scarce; the stables are large and commodious, but the houses very small; men are less conveniently lodged than the cattle. The different properties and pasture-grounds are fenced with very thick hedges, crossing indistinctly the ways and roads, over which travellers are obliged to climb. Here and there, however, mounting stones are placed on both sides of these hedges to facilitate the striding over them, which is very fatiguing.

At a league and a half from *Stanz*, we began to ascend along a winding path the mountains on the left of the

valley, which were quite overgrown with firtrees. This ascent is not very steep, but about two leagues long; and we suffered a great deal from the heat of the sun concentrated in a narrow vale. The view of the precipice on the side of the path struck me by its singularity. Though it is very steep, yet the firtrees root in it, and rise one above the other, so that one might measure the depth of the valley by the length of the trees.

From this height the path winds down into the valley of *Engelberg*; into which we were no sooner descended, than the entrance was shut, and we could see nothing but a pile of gloomy mountains covered with firtrees and of a wild aspect. Before us we had a ridge of very high and craggy rocks capped with snow, surrounding a chain of hills covered with wood and pasture that inclose the valley of *Engelberg*, and secure it against the lavanges ceaselessly rushing down from the superior mountains. Nothing equals the solitude of this delightful retreat, which nature seems to have left by chance in the midst of the rocks she has accumulated in these regions. It is almost a league in length and about half a league in breadth. The hamlet of *Engelberg* and the abbey occupy its centre; two torrents, one of which is very rapid roll their waves at the foot of these hills, and a clear rivulet, gushing out from the earth, flows gently between them.

The abbey is inhabited by Benedictine monks; its abbot is a prince of the holy Roman empire, and sovereign of the valley under the protection of the cantons of *Uri*, *Unterwalden* and *Berne*. The church and the convent are built in a very simple style and singularly decorated, a black unpolished marble, used instead of stone, contrasts pleasingly with those parts of the wall that are left white. The edges of the vault and the steps are also of this stone.

The riches of the abbey consist in its pastures, the whole plain being divided into parks, each of which has its house and herd. During summer the cattle feed on the aromatic herbs of the Alps, and return when the snow invades those

regions. The excellent cheefes made here in great quantity are transported into Italy by *Altorf* and the *St. Gothard*. Having rambled for two days in this country we went to pay our respects to the abbot, who upon general *Pfiffer's* recommendation received us very kindly, entertained us in a very splendid manner, and procured a chamois hunter to guide us over the chain of mountains we had to pass. The winter of 1776 had been very long and severe, all the passages were obstructed by a vast quantity of snow, which the sun of the spring had not been able to melt, and we were thought the first who durst undertake the route through the *Hasliland*; we knew, however, that two days before three peasants were gone over the *Engelberg* and had ascended the *Engstelberg*; but we had not heard whether they were successful in their enterprize or not. After a substantial breakfast we set off from the abbey at three in the morning, in order to reach the snows before the midday sun had softened them; having been told that we should sink pretty deep, we were provided with long poles; and our guide carried some provisions, consisting of a loaf of bread, a quarter of a cheese and two bottles of good Italian wine, which he had fixed on his back with hooks. Thus encouraged we crossed cheerfully the valley, and reached the first mountains. It began to dawn, and though the valley was yet buried in darkness, the surrounding summits were already tinged with a fine rose color. We left behind us the naked conical top of the *Engelberg*, on which the people pretend that the angels were heard to sing on the day of the consecration of the church. To this miracle the abbey owes its name*. Indeed a fitter station could not have been assigned to the angelical choir, than this summit.

Our ascent was so quick that the valley, which we had left, soon looked like a precipice under our feet; the sun rose and the vapors of the earth, detrued by its first rays, rolled beneath us like troubled waves. We entered into a

* *Engelberg* signifies mountain of angels.

maze formed by the edges of the second chain of mountains overgrown with short grass. Mounting still further but with great fatigue, we reached at last, after a painful march of two hours, the first snow, and had a view much like that we had just before left; the small verdant vales through which we ascended lying under our feet in a dark precipice, and we had a similar maze before us to cross; but this was wholly overspread with a white carpet and overtopped by rocks of a prodigious height, resembling in dreariness to the deserts of Groenland and Spitzbergen. In front of us lay the *Dittlisberg*, whose top is scooped out like a saddle, whence the inhabitants call it *Sattel*. It may be seen, and distinguished from the surrounding mountains, at a great distance, particularly from several places in Alsace and even from the steeple of the cathedral of Strasburgh*. I have been assured by the monks of the abbey of *Engelberg*, that in the month of August, when the summit of the mountain is accessible, they can see thence, the same steeple, by means of their spying-glasses; but then the horizon must be absolutely clear, and the sun nearer its rise than its setting. The distance between *Strasburgh* and the *Dittlisberg* is about fifty leagues, which makes me doubt the truth of the assertion of the monks.

After a progress of about a league and a half, over deep snows suspended on the craggy declivity of the mountains, we arrived at the last stage under the *Dittlisberg*, and turning abruptly to our right, found ourselves separated from it on the left by a precipice. The sun being now on the horizon, we waded kneedeep in the softened snow, and in the neighbourhood of the rocks of granite which reflected the heat of its beams, fell sometimes in to our waists. At this height we had sufficient reason to be frightened, and remained for some-time in dreadful suspense; the carpet of snow on which we were marching impended over the unfathomable depths below; the snow

* There are several other mountains which have the same form, and are likewise called *Sattel*. On the side of Berne the *Dittlisberg* is called *Wendenberg*.

was extremely slippery and ready to slide down into the precipice; at every step we caused some part of it to roll down; this swept others along with it, forming beneath us small lavanges, whose bounds and rumbling noise might have amused us very much, if we had not been afraid of those that were gathering over our heads. On a sudden the tumbling became pretty general and we saw a current rushing down, which overwhelmed and carried off our guide who was marching a hundred yards before us.

Our case was desperate; abandoned in the midst of a sea of eternal ice, and lost in a maze of mountains piled upon one another, whence we could find no issue, and where it was impossible to trace back our steps, of which the vast region of rocks interrupted the continuance. These were the first reflections which our forlorn situation suggested to us, and we were communicating them to one another, when the lavange happily rushed against a rock which obstructed its progress; we got sight again of our guide, who, though he had been a little stunned, was in so good a plight that he had not even lost our provisions which were hooked on his back; he was almost a quarter of an hour in remounting to us.

We were stopped here by two torrents, which on these heights are obstructive and distressful to the boldest traveller; for, as they are often accidental, it is impossible, with the best knowledge of the country, to know their course or their size. One of these torrents, along the side of which we had for a long time walked in vain, offered us at last a bridge of ice whose solidity we had every reason to doubt; necessity, however, obliged us to pass over it; and we succeeded, the sun having not yet had strength enough to thaw it; but I believe that an hour later the passage over this singular arch would have been very dangerous.

Arrived at last on the highest part of the passage, we were marching on a ridge which separated two precipices, of which that between us and the *Ditlisberg* was really frightful. Exhausted by hunger and fatigue we had recourse to our

provisions ; and sat down on a flat rock , upon which I and our guide had climbed by the side that was not exposed to the sun ; my companion wanting to get up on the opposite side, sunk quite over his ears into the snow, and we had a great deal to do to pull him out again.

From this rock we had a most extensive view, and such as only the highest Alps can afford ; before us lay a long deep valley covered with the whitest snow, dotted with masses of granite, resembling islands thrown over a vast ocean ; the dreadful summits which inclosed this valley were likewise covered with snow and ice, and reflected the beams of the sun in all the shades between the white and the azure. In withdrawing from us, these summits descended by degrees, and formed a long flight of steps, the uppermost of which were of the color of the sky in which they seemed to lose themselves. From these heights the view of the sky is really glorious ; in the night the stars are brilliant sparks whose pure light shines with a steady lustre ; the moon seemed nigher to us, although its diameter was exceedingly diminished ; it serves for a resting place to the eyes which lose themselves in the immensity : one sees that it is a globe travelling in the neighbourhood of our planet. The sun also offers a new spectacle ; small and shorn of its beams, it shines, however, with a bright lustre, and its light is of a dazzling white ; it is astonishing to behold its disk shine in the obscurity of a sky, whose dark blue seems to fly far behind this luminary, giving a grand idea of the immensity in which we wander. During summer there is hardly any night on these summits which from the plain one may see died in purple a long time after the setting of the sun, when the vallies are already buried in darkness ; and long before the dawn they announce its rise by a fine rose color admirably shading the silver and azure of the ice with which they are covered.

After a hearty breakfast we continued our route ; the precipice on our right was now changed into enormous piles of mountains of the chain of the *Brunig*, over whose declivity

we marched without meeting with the least trace of a road, and always impending over the deep valley which separated us from the *Dittlisberg*. We were surprised to find no snow, although the surrounding rocks were covered with it; this we ascribed to the reverberation of the sun's beams from the *Dittlisberg*; indeed the heat was here almost insupportable. The turf we trod on was really delicious; the snow was no sooner melted than it was enamelled with a profusion of flowers the vivacity of whose colors those of the plain never attain; and which spread the sweetest odors. Even the auricula, indigenous here, has a sweet smell; and the aromatic plants perfume far and wide around the atmosphere.

We saw at the bottom of the precipice, on the edge of which we were walking two seas, the *Trublissee* and the *Engstlersee*, whose diameter appeared to us very small; which however we enlarged on perceiving, on their banks, some solitary firs which we had taken for shrubs, little thinking they were trees; so easily is it to mistake distances and the greatness of objects, to one who is not accustomed to the transparency of the air on the higher Alps.

We came now again to the snow in which we waded up to our knees; without feeling the least cold, for the heat was quite intolerable; it was about ten of clock and the sun reflected from this vast white surface burnt our faces. At last, after having waded above four hours in these snows, we began to descend, and came to a large forest of firtrees, whose gloomy verdure had a very dismal appearance; we were now obliged to stop in order to take some rest, not that we were much fatigued; but our eyes were so dazzled that every thing appeared black to us, and we could not distinguish the ground on which we trod. We were very hungry, and hunger is very sharp in the Alps; those that have a long journey to make in these regions must well provide against it; our appetite was so keen that besides the breakfast we had taken at *Engelberg*, before we set off, we made three others on the road in which we consumed all our provisions.

On our arrival at this forest, and when we were going to step down, I felt a heaviness, which ever since has always oppressed me, when I descended from the top of the mountains into the plain. At these heights the respiration is free, the circulation easy, the organs transmit their sensations in so lively a manner to the soul, that all is delight, the most tiresome labor becomes easy, and the inconveniences of the body are borne with cheerfulness. On the mountains I have often found myself more enterprising, stronger and less timid, the soul expanding herself in proportion to the objects by which she is surrounded. I remember to have had, in these mountainous regions, ideas and feelings which I might perhaps have been able to express then; but of which I have now only a faint remembrance. I never descended from these summits without feeling a certain oppression, my organs were benumbed, my strength diminished, and my ideas confused; like to a man awaked from a trance in which he had beheld the glorious wonders of the world.

We continued to descend through this forest of firs, a noble monument of antiquity and destruction. Of these trees a great number, that had been uprooted by the winds, the lavanges and the torrents, or had sunk under the weight of years, lay prostrate on the ground, which was strewn with huge fragments of rocks torn from the neighbouring mountains. In this desert, and near a considerable torrent, called the *Gentelbach*, which helps to form the *Aar*, there gushes from out of the rocks the *Engstlerbrunnen* or *Metzgerbrunnen*, a fountain of limpid water, which, as the peasants pretend, never flows before the cattle go into the Alps, and always stops when they return into the plain; is very scanty in the night, and only abundant in day time when they feed at large. It is an intermitting spring, supplied by the neighbouring ice, which melts but in summer when the sun is on the horizon.

On emerging from this wood we entered into a narrow glen between rocks of a prodigious height. Those on our
left

left form a long and almost perpendicular wall, above 2000 feet high; its brow was imbrowned by a forest of firs whence issued a great many torrents, some gliding gently down and others rushing with violence, and breaking in a thousand ways on the crags. All these torrents unite at the foot of this wall, and form the *Gentelbach*, which at some distance flows into the *Aar*.

At the bottom of this narrow vale we suffered a great deal from the heat of the sun occasioned by the concentration of its beams; and what added to our misfortune, all our clothes were reduced to rags by the snow.

At last we entered into an inhabited valley, and saw for the first time, since our departure from *Engelberg*, cottages; the delightful fertility of the *Hasliland* was, however, not so agreeable to the sight as the magnificent views from the mountains. At half past two o'clock we arrived at *Meyringen*, after a very painful and fatiguing march.

Instead of entering into the burgh, each of us chose an insulated cottage for his lodging, in order to enjoy some happy days in this rural retreat, the seat of peace and innocence. A young couple who had been lately married, but were not in very affluent circumstances, received us with pleasure into their habitation built at the foot of mount *Houfli*. I preferred this cottage to a bad inn, where I could see but what I saw every day, peasants spoiled by their intercourse with foreigners, who, however scarce they may be in these regions, always pervert the morals of those that are any way connected with them. In all my courses over the Alps I did the same, and this intimacy with these harmless and honest people increased my enjoyments.

The cottage which I inhabited was, like all the others in this country, built of wood alone. Square trunks of fir or

* The summer habitations of the country we had just now transcurred lay still buried under the snow, over which we marched; and the glaciers themselves were not yet uncapped.

of larch are laid across at their extremities, so that the assemblage forms a parallelogram; and not to leave any interstice between the different pieces of timber, their ends are tenanted and mortised. The flat roofs of these cottages are raised in a simple and solid manner, covered on the outside with boards about two feet long and one foot broad. On each transversal row of these shingles they lay a piece of wood of the length of the roof, which they fasten with large square stones to secure it against the violence of the wind. This construction is very common in this country, and very solid.

The wood of the larchtree is preferable to that of the fir and even of the pine; it is less liable to split, and its fibres are more tenacious; although very light, it hardens both in the air and in the water, and unites to these precious qualities that of not easily catching fire. In the *Vallais* all the cottages are built of this wood.

At certain heights in the *Alps*, where wood is scarce, they built their huts of flat stones artfully arranged, and cover them with the same.

In the mountains the houses have mostly but a groundfloor; but on the plain they have two stories, both of which are generally high and convenient enough in considerable habitations. But in the cottages of poor people, the rooms are so narrow and so low, that a middlesized man can hardly hold himself upright in them. That in which I lodged at *Meyringen* was of this kind, and notwithstanding that I was pretty well accustomed to these low rooms, I seldom rose from my stool without knocking my head against the ceiling. The single room on the groundfloor was inhabited by my landlord; in the corner of it there stood a large stove of brick, about three feet high; over which there was a square opening in the ceiling, serving for a door to my chamber, which took up the whole story, by this hole I entered, climbing first upon the stove. My bed was a sack full of dry leaves, on which I was lulled into a voluptuous sleep, by the continual noise of the waters rushing in cataracts from the

distant *Houfli*. At the side of my bed there was a window through which I could see the *Scheideck* and the enormous conical summits of the *Wetterhorn* and of the *Wellhorn* surrounded by their glaciers whose surface was silvered by the moon.

Having given a description of the habitations in this singular country, I shall now proceed to paint the manner of living of its inhabitants.

The ordinary fare of the peasants of the Alps consists in potatoes, and milk, or rather its decompositions. Cheese and curds are their solid food, whey serves them for drink. The curds are precipitated in great abundance from the serous part of the milk, and being very thick, are like the potatoes, eat in lieu of bread. During the greatest part of the year they generally serve up a vast quantity of milk either cold or hot, according to the particular usage of the place, afterwards boiled potatoes with curds, then cheese of the year; and when they will feast luxuriously they close their repast with a piece of very old cheese; whose acridity they temper with whey. Bread is so scarce, that it is only eaten as a delicacy, and but at certain seasons; sometimes in the depth of winter, when they are obliged to live upon the provisions laid up in their cottages, they eat a kind of very hard cake.

Who would believe that there are in Europe, and not very far from us houses into which bread, wine and water hardly ever enter? But what is extraordinary, coffee has found its way into these habitations, where it is drunk almost to excess.

My companion came every morning to visit me, and we passed our time very agreeably among the peasants, who gathered from the different cottages in the neighbourhood. The women sat with their children in a circle, whilst the men played at skittles or wrestled together.

We had frequent opportunities to admire the agility of these people, who, though not so stout as the inhabitants of *Uri* or those of the plains of the canton of *Berne*, are, however,

better shaped. The highlanders of Switzerland have generally fine legs, and a certain gravity and gracefulness in their gait. These would furnish excellent recruits for the Swiss regiments if they were less attached to their native soil, which they never abandon without regret. The only service into which they enter is that of Holland, where they can live upon the same food as in their mountains; in France or Spain they would perish.

The females dress here very much like the modern Greek women in some islands; and widows wear caps in form of a mortar, resembling the mitres worn by the women in the Archipelago, but not quite so high.

The language of this country is a corrupt German, scarcely intelligible to one that is not accustomed to the Swiss dialects.

The *Hasliland* is divided into upper and lower, or *Oberhasli* and *Unterhasli*. *Meyringen*, the capital of the country, lies in the *Upperhasli*, and is commonly called *Gassen*. In the mountains of Switzerland many burghs have two names, the one is found on the maps, and employed in the public acts; the other is a kind of epithet denoting sometimes its form or situation; and this is generally used by the inhabitants.

This valley is one of the most romantic of the country, and very fertile in grass; the neighbouring Alps being covered with the richest and highest pasture grounds of Switzerland. The innumerable habitations which checker their acclivities, receive the shepherds, who in the summer season ascend with their families and herds, mounting gradually as the snow withdraws towards the regions of ice. These emigrations in search of the high pasturages are common in all the Alpine regions. The plain is divided into portions, in the middle of which those proprietors, who do not live in burghs, build their cottages. No one can breed more cattle than he can feed, during winter, with the hay of his inclosure; with these he goes in summer into the Alps, and builds his hut where he chuses. The Swiss give the name of Alps but to the

lower and fruitful part of the mountains. This word must be indigenous in this country, being found in several Celtic dialects. The barren parts of the mountains are distinguished by different names; a rock is commonly called *Flühe*; a mountain or mass of ice *Gletscher*, in the canton of Glaris *Firnen*, and among the Grisons *Wadrer* or *Wadrez*; and the high acuminate eminences which tower above the fruitful Alps bear the denomination of *Horn* or *Stock*, answering to our word *peak*.

The Alps proper for grazing are divided into higher and lower; and a shepherd has very often three habitations, one for winter, another for the spring and autumn, and a third for summer. The winter habitation is the metropolis from which he removes, in the month of May, with his family and furniture, to his hut on the lower Alps, where he stays till July, during which time he descends for some days into the plain, to make his hay, dry it, and lay it up in mow. In July the snow is melted on the higher Alps, and the family goes to settle in the summerhouse, where they remain till the middle of August, when the cold compels them to return to the hut which they had inhabited in the spring, by this time the grass is sprung up again, and the cattle find abundant pasture. During the family's second stay on the lower Alps, the shepherd descends again into the plain, to cut his after-grass, and house it with the hay. In autumn the cattle return into the valley, and browse on the sprouts in the meadows, until the cold confines them to their stables, where they are reduced to dry fodder. To the hay mowed in the plain the shepherds always add that which they cut during summer on the rocks which are inaccessible to the cattle; this, when they cannot transport it otherwise, they tie up in trusses and throw from rock to rock down the mountain.

In some parts, as in the upper *Vallais* the inhabitants of the plain do not go themselves with their cattle on the Alps; but a community sends them under the conduct of a certain

number of herdsmen who tend them, and make cheese from all the cows together without distinction. Twice in the year, and at a fine season, the proprietors assemble on the mountains, and divide the cheeses that have been made in proportion to the number of cattle which they have in the herd. If, whilst they are thus together, a cow perishes either through carelessness or by accident, the loss is not for the proprietor alone, but for the whole community. Such losses are very frequent, particularly at the latter end of summer, when these animals venture on the edges of precipices to crop some herbs, which they had neglected whilst there was plenty elsewhere, and fall down into hollows.

The best cheeses are made during summer, and on the top of the highest Alps. The cows are milked twice a day, and one will give from six to twelve quarts of milk*. Notwithstanding this amazing abundance, these good people fancy that there has been a time when it was still greater: tradition, they pretend, has transmitted to them the memory of a happy age, when the glaciers had not yet invaded the finest part of their Alps, when the plants now poisonous were salutary, and the spurge augmented with its milk that of their cows, which might be milked thrice a day. The sins of men, they will add, have drawn down the curse of heaven, and the ice on their pastures.

Although the noxious plants which infect the pasturages on the Alps are not very numerous, they are nevertheless dangerous for young kine that graze for the first season, and have not yet learnt to distinguish them; for, such as have past a summer on the mountains will not touch any of them. The most remarkable of these vegetables is the *wolf's bane*, which partaking of the favors of nature, acquires in these fruitful

* This milk is so fat, that after being skimmed it is still as thick as paste. In the canton of *Unterwalden* they try the cream by laying a knife upon it, which will swim, when it has not been mixed with milk.

mountains all the qualities of the *manchineal tree* of America; the poison of the wolfsbane with white flowers, is so violent that it corrodes the skin when softened by transpiration. As a proof of the deleterious quality of this weed, general *Pfiffer* related to me the case of a young betrothed couple, who having danced a whole evening together, fell both dead a little time after, poisoned by the effluvia of a nosegay of this plant, which the young man held in his hand. The general himself, having one day gathered some flowers of wolfsbane, felt very soon a numbness in his wrist and part of the arm, which would have made a rapid progress if he had not immediately thrown them away.

The best cheese is made in the higher Alps, without salt; fermentation being sufficient to sharpen its taste, in which the aromatic flavor of the plants predominates. That which is made in July and August keeps very long, when the paste has been well kneaded; and there is no eye to be seen in it, which is always a sign of salt or of carelessness in the making. The cheeses are formed in loaves some inches thick, and weigh from ten to fifty pounds; after having lain for some time piled up one upon the other, inclosed in hoops which serve them for moulds, a heavy weight is laid upon them, by whose compressure the whey is squeezed out, and the holes are closed. being now compact enough, they are carried into sheds and exposed to the cool air, but carefully protected against the cold and humidity, which would spoil them. These sheds are built like the cottages, but the timber not being joined so close, the air circulates freely through the interstices. To guard them from the mice they are set about four or five feet above the ground on posts placed at the four corners, and covered with a large plate of slate which juts out on every side. In winter they are taken out of these sheds and put into cellars, where they are sheltered against the frost; and may be kept a whole age. Dining with the curate at *Lauterbrunnen* I tasted some that was above sixty years old. It was much like a cake of yellow wax, exceedingly dry, easily breaking in crums

and of a very strong taste; old people use it as a digestive after having eat younger cheese, their common fare. On those Alps which divide the Swiss cantons from the Vallais the shepherds are accustomed to make cheeses with particular care, to memorize certain events in their families, such as births or weddings. These cheeses are always marked with the names of the persons and the dates of the ceremony: they also salt or pickle pork, which being kept with the same veneration, and served up at great solemnities, is offered to strangers as a particular mark of consideration. An acquaintance of mine, who has tasted some that was five-and-twenty years old, did not praise much its strong aromatic flavor. This custom reminds me of that of the ancient Cyprians, who on like occasions buried casks of wine, of which many are now found by digging.

The old cheeses of which I spoke are not very common, and never sold*; the others are carried into Italy. Those that go over the St. Gothard are vended at Milan by the mule drivers, at the same price at which they have been bought in the mountains: the expense of the carriage is gained upon the difference of the weight; the Swiss pound consisting of twenty-eight ounces, and that of Milan but of eighteen.

Beside kine, the *Upperhasli* feeds also a great number of horses, which are bred in parks on the plain, and on the Alps; when they are six months old the graziers drive them into Lombardy where they sell for about four guineas piece.

The *Upperhasli* is surrounded on the East, South and West by a long ridge of conical mountains of an amazing height;

* There is a great variety of cheeses made in Switzerland; but all are not equally proper for keeping. That of Unterwalden is fat and sweet, and has no salt. That of the upper parts of the cantons of Berne and Uri is dry, aromatic and very strong, though it be not salted neither. That of the lower part of the canton of Berne is putrid and salted, and is preserved only by being often besprinkled with wine; whereas the least humidity impairs the quality of that which is made on the higher Alps.

which are the highest degree of that stupendous chain which separates the canton of Berne from the Vallais, and forms the centre of the Swiss Alps. Thence the country subsides in the plains of Germany, France and Italy. Savoy alone opposes to this mass of mountains another which is as considerable. *Montblanc* and the *Schreckhorn* form the centres of these two chains of mountains; and from the sky one might see these two dreadful rocks, surrounded by their towering attendants contend for the empire of the loftiest mountains in the ancient world. *Montblanc* is the highest, and overwhelms the neighbouring vallies with a deluge of ice. The *Schreckhorn*, less in size, and not so high, yet being much more acuminate, is, though defended by smaller ramifications of glaciers, much less accessible than its rivals; the precipices that surround it are deeper, the ice is more broken, and its declivity so steep that the snow cannot rest upon it. Like *Montblanc*, it is the point where the different ramifications of crystals, as if sympathizing with the branches of the glaciers, meet*. Like *Montblanc*, it is the rendezvous of clouds, and the dispensator of rivers; but in this last respect it has perhaps the superiority: the most considerable rivers issue from its domains, nor can the monarch of the Greek and Penine Alps boast of the Rhine†, the Rhone and part of the Po. It was this chain of the *Schreckhorn* that stopp'd the lords of the world in their victorious career; for having over-run the mountains of the Allobroges and the Rhetian Alps, they beheld with astonishment this new barrier which they dignified with the name of higher Alps; nor durst they attack its inhabitants; but, wisely resolved to stand upon the defensive,

* For this observation I am indebted to my companion.

† It is worthy of notice that, on flowing out of Switzerland, the Rhine rolls its own waters; its three first branches taking their source in the same chain of mountains. The Aar and the Limmat, which by their junction increase it so considerably, are themselves swelled by rivers descending from the same quarter.

built the famous wall in the Vallais between the Rhone and the *Burberg* *.

The *Schreckhorn* or *terrible peak* owes its name to its frightful aspect; from its acuminate form it is likewise called *Nadel*, needle. Its nearest neighbours are the *Wetterhorn*, the *Wellhorn* and the *Jungfrauhorn* †, three naked, conical rocks, somewhat lower, and separated from the *Schreckhorn* by vallies of ice. The *Wetterhorn* or *stormy peak*, whose summit is constantly wrapt in clouds, is thus called from its being situated to the North-east of the *Schreckhorn* whence it receives the tempests coming from the South and North-west. The *Jungfrauhorn* or *Virgin-peak* owes its name to a prevailing notion that, though accessible at its foot, its height could not be explored. However about sixty years ago two chamois-hunters tried successively this perilous ascent; the first having left his knife under a stone, on the top of this peak, his comrade went up, took it away, and put his own in its place, which has remained there ever since.

The *Wetterhorn* bears also, and deservedly, the name of *Jungfrauhorn*, which it will probably never lose. All its points are discernible at a prodigious distance; they are seen from all parts of Alsace, closing the horizon towards the South.

* The Romans occupied the best part of Northern Helvetia, without ever penetrating to its centre; they crossed on one side the Grecian Alps, and on the other the Eastern part of mount Adula. It does not seem that they ever went over the intermediate chain, of which the *Schreckhorn* is the centre, and which was inhabited by the fiercest of the Helvetian nations. The wall in the Vallais has probably been built in order to restrain the irruptions of the inhabitants of the Western parts of mount Adula, driven on the Roman frontiers by the barbarians of the environs of the *Schreckhorn*, who passed the *Grimfel*, which, though part of the chain of mount Adula and bordering on Rhetia, was only known by the excursions of the mountaineers.

† Between the *Wetterhorn* and the *Wellhorn* rises the lofty *Schwarzwaldgletscher*, or *glacier of the black forest*, which may be seen from Meyringen, and is quite inaccessible.

Among these enormous peaks, coeval with the world and created along with it, whose bare carcases show the matter whereof the second covering of the earth's centre is composed, there appear mountains of a more recent structure, whose shape betrays the mystery of their formation. These are ridges of a middling height, which, like the currents to which they owe their birth, wind between the primitive mountains, separating their points, and the different districts of these regions. They are very numerous, and commonly called *Scheideck*, from *scheiden*, to part. Some of them have received other names, which, however are not less characteristic of their origin. Of this number is the *Steinberg*, which took its rise from the subversion of other mountains, of the rocky wrecks of which it is apparently composed.

This country exhibits, in the different ages of its mountains, a picture sublimely terrible of the vicissitudes of nature, her slow operations, her sudden freaks, and her dreadful disasters. On these rocks, generated and decayed in the course of more than thirty centuries, these carcases of mountains, hurl'd into the vallies which they formerly overlooked, and buried under huge masses of ice, the curious observer will read with amazement the annals of the world, and the history of its revolutions.

In this dreary waste lives the *Lämmergeyer*, or eagle of the Alps, the greatest and the fiercest of the feathered kind, surpassing both in strength and size the royal eagle, who inhabits but the highest mountains of our hemisphere*. To this bird nature has assigned an immense domain for his subsistence; and one sees seldom two of them together in the same region; for they would starve one another in a country which feeds a multitude of their subjects.

* Mr. de Sonnini the learned editor of Mr. de Buffon's Natural History, has classed this bird, which he calls *Gypate des Alpes*, between the eagle and the vulture. See vol. xxxviii, p. 214.

The *Lammergeyer* preys chiefly upon the *chamois*, to take which it behooves him to exert his utmost strength and cunning. As nimble on the ground as the bird is in the air, this animal frisks on the edge of the steepest precipices, scampers over craggy rocks, and leaps over the widest chasms. Endowed with force proportionate to its swiftness, this creature is in no wise unworthy to fall a prey to the tyrant of the air*. The *Lammergeyer* seeks for it in the farthest recesses of the most desert vallies, where it feeds secure from the pursuit of men; frightened and obliged to run for shelter, the timid animal flees to the rocks, but is pursued thither by the bird continually wheeling round, and driving it upon the heights, where it scours along the ice, leaps from cliff to cliff with incredible swiftness, until flopt on the brink of a precipice, it has no other resource but to fight its foe. The bird hovering about, stoops down, tires it by repeated attacks, which it wards off with its horns; but as soon as he sees it stagger, he pushes it from the rock down into the valley, where it is either dashed to pieces, or when alighted alive, despatched and devoured. A few years ago one of these birds that had been lamed by a shot in the wing, was taken alive by three peasants, and sold at Basle.

The government of Berne pays a Louis d'or for the killing of a *Lammergeyer*. This reward is too inconsiderable to make the peasants eager after the pursuit of a bird, which, living mostly on *chamois*, marmots and the carcases of beasts that have been carried off by avalanches, or died by other accidents, is little dangerous to their herds. The *Lammergeyer* is also continually at war with the ravens who infest these regions; and their battles are very curious; the tactics of this aerial militia offering a singular spectacle. The ravens draw up in a line, divide in squadrons, advancing by turns; and the eagle attacked on one side, is soon assailed on the other by a fresh body, making a diversion in favor of the retreating

* The *chamois* is not much larger than a goat, which, however, it exceeds in strength; for the strongest man is not blea to hold a young one by the legs.

division. Victory remains for a long time doubtful, especially when this bird is yet young. It is impossible, in beholding this conflict, as I have done, not to wish success to the monarch of the air against this vile rabble of the sky. The field of battle being vast, and the militant parties wheeling round a mountain, I lost sight of them, and could not see the issue of the fight.

Bears abounded formerly in this country, but they are now become very scarce in the Northern districts, and only to be found in the Vallais, where there are two kinds of them; the large feed on vegetables and sleep during winter; the less live upon flesh, are very fierce, and, in the frosty season, make great havoc among the herds. I have been at a bear-hunting between mount *Furca* and the *Grimfel*, a sport which is not very dangerous. There is a natural enmity between the bull and this beast; the former no sooner smells a bear in his neighbourhood, than he goes in pursuit of it, and meeting, they will fight for many days, until one of the combatants drops dead*.

Wolves are rarely met with in these regions; but there is a sort of wild cat, which makes terrible ravages among the flocks. These different beasts are continually pursued by the peasants who assemble in great numbers to destroy them.

Besides this war, defensive of their herds and flocks, these mountaineers wage an offensive one, against animals of a softer nature; a great number of them hunt the chamois. The pursuit of this nimble-footed creature, over craggy rocks and inaccessible deserts, is both difficult and dangerous. The chamois

* In the plain the bear has the advantage; but in the woods and among the rocks the bull is generally victorious; that of a herd in the canton of Uri, having pursued a bear, did not come back; but was found some days after quite stiff, squeezing his dead foe against a rock. So violent were the efforts which he made, that his feet were sunk several inches deep in the ground.

inhabits the most frightful precipices, whose aspect startles the boldest hunter; here, however, he must dislodge the animal, which, having a very accurate sense of distances, no sooner perceives its pursuer near, than it scours away over the crags with amazing swiftness, the hunter marks its route, and follows leisurely, taking care to keep the wind in his face that the noise of his steps and the scent of his body may not betray him. Notwithstanding this precaution, he very seldom can approach it within gunshot, until some inaccessible rock forces it to stop. Towards this cliff, frightful even to the chamois, the hunter advances undismayed and with firm steps, on crags affording hardly any hold to the smallest foot. In such a situation he can not always make use of his gun, but is sometimes obliged to scare the animal down into the precipice, which being often too deep, the chamois will not abandon the brow of the rock, threatening to hurl its pursuer himself down; and it has happened that in despair it flew at the hunter, either to gain his post or to perish along with him.

This chase costs many lives; in the thick fogs, which on a sudden overveil the whole country, the hunters lose themselves on the ice, and are starved; sometimes the frequent showers render the rocks so slippery that there is no firm footing on them; * at other times the heat and the driving sand will parch their faces to such a degree that they are obliged to moisten them, for want of water, with the blood which they draw by incision from their legs.

The inhabitants of the *Upperhasli* are very expert in this chase; the profit which they drew from it has emboldened them to pursue the chamois into its farthest retrenchments; and the number of these animals has of late considerably decreased in the Alps †.

* Mr. *Pfiffer* having one day observed to the abbot of *Engelberg* that, among the craggy rocks, which surround the abbey many hunters must perish, was answered that last year he had lost but five. His district is scarce the hundredth part of the Swiss Alps.

† In many parts of these mountains the number of chamois

It is a surprising spectacle to see a chamois-hunter of the canton of Berne ranging over the most rugged parts of the mountains. Nothing can stop him; disdaining to follow the paths, he finds a footing on the most inconsiderable projection from the rocks. But his descent is really frightful; leaning on his stick he slides from rock to rock and seems to fall rather than to descend*.

The Vallaisans very often behold with amazement the chamois-hunters come sliding down in this manner from the Gemmi, whose naked side is almost perpendicular; in ten minutes they will descend from a height, from which any other would not step down in an hour. The people of the Vallais are not very forward at this sport; and the honest curate who had given me the history of the Devil's Bridge assured me, that none but protestants would descend in this manner; adding *that the catholics took better care of their souls; as the priest would refuse his absolution to a man who durst expose himself to such evident danger.*

Before I take my leave of the environs of the Schreckhorn I must observe that the country which it commands is the highest, and consequently the oldest, of Europe. It has certainly been more populous formerly, when its soil was less desolate, and the mountains were not so acuminate, nor the vallies so deep; at a time when the different passes were not yet so much obstructed with ice, whose dissolution has since swelled the rivers and changed their gentle flow into destructive deluges. The country was then higher, and the sides of the hillocks, since risen to towering mountains, were covered with luxuriant pasturages. In those remote times that may be killed annually is fixed. The flesh of this animal is very delicate, the skin valuable, and the horns together with the bones are useful.

* During my stay in Switzerland I have also learned to ride down a mountain leaning upon a stick, and practised this manner of descending with success on the snow and the ice, but very seldom on the rocks.

the inhabitants of these regions, multiplying very fast, transgressed the natural boundaries of their country, in search of new habitations, and extensive meadows in Transalpine Gaul. Nor was this the only cause of their emigration; they were also animated by that spirit of warfare, which had roused the Northern tribes destined to subvert the Roman empire; but, after being defeated by Cæsar in several successive battles, which procured him the honors of a triumph, were at last compelled, by succeeding generals, to return to their fastnesses, where the limits of their country were still more contracted. It should seem that Helvetia was then wholly reduced under the subjection of these lords of the world, and that the heart of the Alps was not like other mountainous countries secure from the invasions and conquests of the Romans, who were none of those hives which circumambulated successively the habitable globe, driving before them the nations which they invaded, and substituting new races of men in the place of those whom they had either destroyed or dispersed. Similar to a river overflowing its banks, those torrents of barbarians overwhelmed only the plains; for any ridge of mountains always obstructed their career. But nothing could stop the Romans, whose progress resembled a conflagration, involving in one general wreck, both towering mountains and lowly dales. The vigorous perseverance with which this people restrained, during three centuries, the inroads of the barbarians, and destroyed their rising generations in their birth, will give us a more adequate idea of their powerfulness, than the destruction of Numantia and Carthage, the conquest of the West, and the devastation of the South. I do not, however, hesitate to assert, that the centre of the higher Alps has never been explored by those conquerors, to whom the different passes were unknown, and who opposed to its inhabitants strong walls, whereof some ruins are still to be seen in the Vallais. In the neighbourhood of the *Schreckhorn* there is not the least trace to be found of the presence of the Romans; the surrounding mountains have no
such

such Latin denominations, as those which the Greek, Penine and Rhetian Alps have preserved as indelible marks of their subjection: this part is shut up by stupendous bulwarks; and the consular roads cross only the Eastern part of the chain of the *Adula**, a portion of the country of the *Allobroges* and the neighbouring districts, with which the rivals of Carthage were unacquainted before the astonishing expedition of Hannibal. To the South of the chain of the *Schreckhorn* dwelt the *Seduni* with the *Vibisci*, nations that had been subdued by Augustus, but whose recesses on the heights of the mountains remained unexplored, and part of the *Lepontii*, of whom the Romans knew as little as of the Rhone †. Towards the North those conquerors have not pushed their conquests much beyond the lake *Leman* and the colonies of *Minnodunum* and *Aventicum*, &c. Nor had the Western parts of *Rhetia*** ever been penetrated before the invasion of the Burgundians, who like a torrent overran all Helvetia. This invasion happened about the time that innumerable tribes of barbarians, having broken down the barriers which the Romans had opposed them, overflowed the empire from East to West. The Franks spread themselves over Gaul, and the Anglosaxons in Brittany; the Burgundians, crossing the Rhine, settled on the opposite banks, in the beginning of the fifth century. Their dominion over different parts of Helvetia is pretty well attested, and we find in the name which the *Dittlisberg* bears

* I have already spoken of this chain, consisting chiefly of the *St. Gothard*, mount *Furca*, the *Grimfel*, the *Grispalta*, and the *Vogelberg*, about which the opinions of the Romans were divided.

† The *Seduni*, the *Vibisci* and the *Nantuates* inhabited the lower part of what is now called the *Vallais*, whereof the heights were occupied by the *Leontines*, whose settlements extended over the Eastern part of the Penine Alps, and round the sources of the Rhone.

** The lake *Leman* is at present that of *Geneva*; *Minnodunum* is *Moudon*; *Aventicum*, *Avenches*; and *Rhetia*, the country of the *Grisons*.

on the side of Berne, traces of their descent into the Eastern and Western vallies of the *Schreckhorn*, part of which composes now the *Upperhasli*. The word *Wendenberg* signifies mountain of the Vandals, of which nation the Burgundians were in the first century members. We have, however, no proofs of the retreat of the inhabitants before these invaders; and it is very probable that, secluding themselves within their mountains, they communicated but with those Northern tribes that were become Germans, to whom they are also beholden for the change in their language, which, whilst they were subject to the Romans, was a dialect of the Celtic. From this people several mountains have no doubt received the names by which they are still known. The Burgundians subdued this part of Switzerland at their entrance into the country; the hills which form the first and lower inclosure bear still, in the ruins of the castles, with which they have been formerly crowned, the badges of feudal government, which had arisen out of the ruins of the second kingdom of the Burgundians; there is, however, great reason to believe that the mountains have ever been an inviolable asylum; and that the highlanders of Helvetia, like those of Caledonia, have successively faced the Roman legions, repulsed the German and Norman invaders, and braved the iron yoke of the feudal lords.

I shall not attempt to penetrate through the gloom in which the different epochas of the history of the West are involved; some faint glimpses, shining here and there in this obscurity, are not sufficient to guide our researches; nor would the brightest torch cast the least twilight on the dark intervals that separate those accidental flashes; but I shall only add to the inductions which are to be drawn from the premises, that if we may judge of the antiquity of a nation by the nature of the soil which it inhabits, the simplicity of its manners, the invariableness of its customs, and by evident marks in its language, we must look upon the people dwelling in the environs of the *Schreckhorn* as very ancient and even indigenous.

Their way of living, their habits and manners are constantly, and have probably from time immemorial been, the same; and there lives among them a race of shepherds, who seem to have been settled here since the first ages of civilization. In some cottages on these mountains one meets with registers, wherein those good people have marked, from father to son, the pedigrees of their herds, for a long series of years. I have seen one of these chronicles recording the uninterrupted history of the revolutions of the neighbouring glaciers, and the annual increase or diminution of their cattle. These events, the sole that can interest a people who know nothing but their mountains and their herds; and whose life is so uniform that they do not distinguish a single era in it, are written in thirty different hands, with the same characters, and in the same style. The names even of these highlanders attest the antiquity of their race. They bear those of the places in the vicinity of which they built their cottages. One is called John Rock, another Peter Orchard, and a third James Wood; however, the rock from which the first borrowed his name is, since many centuries, covered by a glacier; there is no trace of an orchard to be found near the cottage of the second; and the forest which overshadowed the dwelling of the third, has been overwhelmed by an avalanche; time out of mind.

By comparing what I have said here, with my account of the democratical nations, the reader will be enabled to form an adequate idea of the shades which characterize the diverse portions of the inhabitants of the Alps. They are very numerous. Even among the herdsmen I have remarked two very distinct races, not only in separate cantons, but sometimes in the very same. The inhabitants of the lower vallies, who are only shepherds by choice, I found also very unlike those which are spread over the neighbouring heights; which seem to be of a truly nomade origin; and to these principally, we must apply what I have said of the aborigines that inhabit the higher Alps.

Want of leisure and of opportunities prevented me from making any farther researches into the antiquities of this people. The sovereign council of Berne, have as I am informed lately caused inquiries to be made in order to ascertain the state of the ancient possessions of the highlanders, and the progress of the ice during several centuries, which will, no doubt cast a great light on the natural and moral history of the most interesting part of the Alps.

LETTER 31.

Fall of the Reichenbach—Passage of the Scheidec—Valley and Glaciers of Grindelwald.

Grindelwald, August 13.

WE left Meyringen this morning, crossed the Aar, and mounted the Scheidec³ through a beautiful forest of beech, poplars, mountain-ash, and pines. About two miles from Meyringen we dismounted at a small village, and passed along some fields in order to view the fall of the Reichenbach,⁴ which is deservedly celebrated for its variety and beauty.

The Reichenbach has its source at the foot of the Wetterhorn; and rolls in numerous cataracts down the steep sides of Mount Scheidec, until it unites with the Aar near Meyringen.

³ I have spoken above of the different mountains that bear this name. RAMOND.

⁴ *Reichenbach* signifies *rich torrent*; a name it derives from the vast quantity of particles of gold which it rolls, whereof the greater part remain at the bottom of the abyss into which this river precipitates. The lighter particles are driven by the agitation of the water to the surface, and carried by the stream into the Aar. RAMOND.

The fall of the Reichenbach may be divided into three principal parts.

The first, which alone is usually visited by travellers, precipitates itself from an overhanging rock, is reduced into spray and foam, and in that state falls in a perpendicular column, at least from an elevation of two hundred feet, into a natural basin, from which it overflows, and is soon lost in the abyss beneath. The rock itself is concave, arched, totally bare, excepting its summit, which is feathered with shrubs; and being of black marble, forms a striking contrast with the pure whiteness of the descending foam. Part of the spray rebounds on the rock, and glides gently into the basin in many a silvery current.

The second cataract begins from the overflowing of the basin; and is most advantageously seen from a large tree which impends on the sides of the precipice. In this part the torrent forms a second perpendicular column of water, which is half obscured, as it dashes through a chasm of projecting rocks.

The best point of view for seeing the third cataract is in a meadow at the bottom of the second. From that situation the whole Reichenbach seems one immense water-fall; the bottom of the first, and the top of the second cataract, being concealed by the intervening hills. From thence it rolls nearly in a horizontal direction; is divided into two streams by a rocky island beautifully sprinkled with trees, and impetuously descends in two unequal bodies. It then dashes over broken crags of black marble, through groves of beech, mountain-ash, and pines, and rich grounds interspersed with hamlets.

On viewing the various parts of this stupendous fall, I was as much interested and affected, as Aristæus is represented by Virgil, when his mother Cyrene points out to him the sources of the principal rivers bursting at once from the earth.

*Jamque domum mirans genitricis, & humida regna,
Speluncisque lacus clausos, lucosque sonantis,
Ibat, & ingenti motu stupefactus aquarum.
Omnia sub magna labentia flumina terra
Spectabat diversa locis; Phasimque, Lycumque,
Et caput, unde altus primum se erumpit Enipeus,
Unde pater Tiberinus, & unde Aniena fluenta,
Saxosumque sonans Hypanis, Mysusque Caicus,
Et gemina auratus taurino cornua vultu
Eridanus, qua non alius per pingua culta
In mare purpureum violentior influit amnis⁵.*

We next ascended by the side of the Reichenbach, crossed that torrent over a bridge; and, having traversed several plains, or rather undulating vallies, beautifully sprinkled with ash, poplar, and other large trees, we continued our route at the foot of some enormous mountains, which are

⁵ With wond'ring eyes he views the secret store
Of lakes, that pent in hollow caverns roar;
He hears the crackling sound of coral woods,
And sees the secret source of subterraneous floods;
And where, distinguish'd in their sev'ral cells,
The fount of Phasis, and of Lycus dwells;
Where swift Enipeus in his bed appears,
And Tiber his majestic forehead rears;
Where Anio flows, and Hypanis profound
Breaks thro' th' opposing rocks with raging sound;
Where Po first issues from his dark abodes,
And, awful in his cradle, rules the floods.

Dryden's Virgil, Georg. book iv.

called by the general name of Wetterhorn⁶, or *Stormy Peak*. This enormous group, which forms the Wetterhorn, is peculiarly striking, as well from the naked majesty and grandeur of its rugged peaks, as from its being more insulated than the neighbouring mountains, and because, in passing from Meyringen to Grindelwald, it presents itself the first of this stupendous chain⁷.

After having ascended about three hours from the time of our quitting Meyringen, we refreshed ourselves and our horses in a delightful vale strewn with hamlets; a sloping hill, adorned with variegated verdure and wood, on one side; on the other, the Rosenlavi and Schwartz-wald glaciers stretching between impending rocks; and before us the highest point of the Wetterhorn lifting its pyramidical top capped with eternal snow.

⁶ The several peaks of this mountain go under different appellations; and are not ascertained without much difficulty, the peasants usually mistaking and confounding them. One is called the Wetter-horn, another the Nager-horn, a third the Engel-horn, and the highest point takes the denomination of Jungfrau-horn, or Virgin's-horn, for the same reason as the mountain of that name in the valley of Lauterbrunnen, because its summit is inaccessible. Hence several travellers have mistaken this peak for the real Jungfrau-horn.

I have mentioned these circumstances, in order to prevent the confusion of names puzzling future travellers as they once puzzled me.

The word *horn* in German, which bears the same signification as in the English tongue, is applied to the highest peaks, as in French *aiguille*, or needle.

⁷ To those who go from Grindelwald to Meyringen, the Wetterhorn is the last of this chain. Hence the traveller will not, perhaps, be so much affected with its majesty and grandeur, as if he first observed it in ascending from Meyringen. I mention this circumstance, because all descriptions are comparative.

As we were taking our repast, we were suddenly startled by a noise, like the sound of thunder; occasioned by a large body of snow falling from the top of the mountain, which, in its precipitate descent, had the appearance of a torrent of water reduced almost into spray. These *avalanches* (as they are called) are sometimes attended with the most fatal consequences: for, when they consist of enormous masses, they destroy every thing in their course; and not unfrequently overwhelm even a whole village. The best preservative against their effects being the forests⁸, with which the alps abound, there is scarcely a village, if situated at the foot of a mountain, that is not sheltered by trees; which the inhabitants preserve with uncommon reverence, as their common protector. Thus, what constitutes one of the principal beauties in the country, affords also security to the people⁹.

We continued our course at the foot of the Wetterhorn, which in this part is so extremely perpendicular and tapering as to appear like half of an immense pyramid. Here we conceived it impossible, that any scenes could be more rude and majestic than those before us; but on reaching the top of the Scheidec, we burst upon a view which so far exceeded them in wildness and horror, that we unanimously exclaimed, "There is the *Schreckhorn*, or the *Peak of Terror*."

⁸ A forest never resists the fury of an avalanche so powerfully as when it is placed high enough to break the current of the snow; lower down it will be swept away by it. R.

⁹ In the vallies the houses are secured towards the mountains by a strong stone-wall, whose sharp angle divides the snow and saves the habitation from total destruction, though it should be buried under the avalanche. RAMOND.

The descent from hence to Grindelwald is gentle but tedious: that village, consisting of numerous cottages, dispersed over the plain and upon the rising hills, exhibits an agreeable and picturesque scene, heightened at the same time by a view of the vallies of ice; which stretch along the steep sides of the mountains in a regular curve, and are beautifully skirted with wood.

The two vallies of ice, which extend into the plain of Grindelwald, are called the Superior and Inferior Glaciers. The former lies between the Wetterhorn and the Mettenberg; the latter between the Mettenberg and the Eger-horn. The Mettenberg is the base of the Schreckhorn; and the Eger-horn, or *Pointed peak*, borders on the valley of Grindelwald, and slopes gradually from barren rock and snow to fertility and cultivation¹.

August the 14th.

Dare I confess to you, that I am somewhat disappointed, and that a nearer view of the glacier has not sufficiently compensated for the fatigue and trouble of the expedition? But I have promised to write from my own feelings, and not to send an account taken from exaggerated descriptions. — We sallied forth this morning full of impatience; and arrived at the bottom of the Inferior glacier, forming a majestic arch of ice; from whence issued a loud torrent of snow-water just melted. This glacier is composed of numerous pyramids, which are more elevated towards the plain; being from about forty to fifty feet high,

¹ For a further account of this chain of Alps, which are contiguous to the vallies of Grindelwald and Lauterbrunnen, see Letter on the Chain of Alps observed from Berne.

and gradually shortening, until they terminate in a broad surface broken into deep and wide chasms. We mounted a very difficult path at the edge of the frozen region, occasionally passing over the steep and craggy parts of rock almost perpendicular, along the very sides of the precipice: the danger of which makes me shudder even now. This glacier is several miles in length, and is supposed, by many travellers, to join the glacier of the Aar, which I visited in my expedition to the top of the Grimsel. But the reverend Mr. Wytttenbach of Berne, who has frequently examined its direction from the adjacent heights, assured me, that those two glaciers are separated from each other by a chain of abrupt and perpendicular mountains.

After having employed above two hours in ascending, we were prevented from continuing our progress by rugged rocks, and a rising hill of ice; our guide assuring us at the same time, that it was impossible to proceed any farther. Of this we were by no means convinced; but not having any conductor who could lead the way, and not daring to explore these unknown regions by ourselves, we descended with heavy hearts; much disappointed, that what we had seen, though certainly a very curious and sublime sight, did not equal our expectations: and it added to our chagrin, on being afterwards informed, that though we could scarcely have proceeded further in the direction which we took, yet, that if we had followed another path, we might have penetrated to the Superior glacier, and have reached the base of the Schreckhorn. In that part between the mountains, now occupied by the Inferior glacier, there was formerly a road, which communicated

with the Vallais, but is at present impassable; and a spot was pointed out to us, now covered with ice, where once stood a small chapel.

What peculiarly distinguishes the glacier of Grindelwald from that of the Furca, is, that the latter lies amid barren and craggy rocks, in a most desolate, dreary, and uninhabited country; whereas this valley of ice joins to a very fertile plain, and borders upon cultivation: in other respects the Furca was a much more striking object. Not far from this glacier of Grindelwald, pines, willows, ash, and oaks, grow and come to perfection: and near the borders of the ice I gathered strawberries and wild cherries, and observed hazelnuts, barberries, and mulberry-trees. The valley of Grindelwald is extremely fertile; it produces barley, rye, hay, hemp, and fruit-trees in great abundance, and feeds above two thousand large cattle.

I am, &c.

L E T T E R 32.

Valley and Glaciers of Lauterbrunnen — Fall of the Staubbach.

THE road from Grindelwald to this place is good, and we met a cart, which to us is become a remarkable object, not having seen any thing that moves upon wheels since we quitted Lucerne. The country is pleasingly diversified with hanging woods, immense rocks, deep precipices, and violent torrents. But I suppose you are by this time as much accustomed to rocks, precipices,

and torrents, as the readers of Fingal to blue mists and hollow winds².

The valley of Lauterbrunnen is embosomed in the midst of the alps. The western boundary of the valley, from which the Staubbach falls, would, in any other country, be called an enormous mountain: it here appears only a trifling hill in comparison with the opposite chain, of which the highest point is the beautiful Jungfrau-horn, that stretches in a semicircular direction, and overlooking the adjacent peaks, rises to a stupendous height.

We are now lodged at the house of the clergyman of Lauterbrunnen; a little village, or rather collection of cottages, sprinkled, like those of Grindelwald, about the valley and accessible parts of the hills. Near the house, is the celebrated fall of the Staubbach, which I am just returned from viewing. This torrent rolls perpendicularly from so considerable a height, as to resolve itself into fine spray; the greatest part of it falls clear of the overhanging mountain, during its whole descent; but the remainder dashes about half way against a projection from the rock, and flies off with great violence. The clergyman measured, a short time ago, its perpendicular height, and found it nine hundred and thirty feet. The sun shining in an opposite direction, a miniature rainbow was

² A nearer and more interesting, but more difficult passage, conducts over the Scheidec from Grindelwald to Lauterbrunnen. In my second expedition into these parts, I proposed traversing this passage, and had actually set off for that purpose; but a violent shower obliging me to change my resolution, I continued my journey along the same road as on the former occasion.

It may be proper to apprise the traveller, that there are two Scheidecs, the one separating the vallies of Grindelwald and Meyringen, the other those of Grindelwald and Lauterbrunnen.

reflected towards the bottom of the fall: while I stood at some distance, the rainbow assumed a semicircular figure; as I approached, the extreme points gradually coincided, and formed a complete circle of the most lively and brilliant colors. In order to have a still finer view, I ventured nearer and nearer; the circle at the same time becoming smaller and smaller; and as I stood quite under the fall, it suddenly disappeared. When I looked up to the torrent, in this situation, it resembled a cloud of dust: and from this circumstance indeed it takes its name; Staubbach signifying, in the German language, a *spring of dust*. I paid for my curiosity, by being extremely wet; but then I had the satisfaction, at the same time, of seeing a rainbow in miniature: no uncommon phenomenon, as it may be observed in any cascade, upon which the sun shines directly in a certain position. In the present instance, however, it was some consolation to me, that the object happened to be peculiarly striking.

The next morning we rode to the extremity of the vale, in which there are some noble points of view, and ascended to the glaciers, which stretch from the feet of the Breit-horn and Gross-horn. In this delightful valley many streams³ of the clearest water gush from the earth like small rivers, and numberless torrents precipitate themselves from the mountains. I noticed two in particular which fall from a greater height than even the Staubbach, but as their descent is not so direct, they are less extraordinary.

³ From which circumstance it receives its name, *Lauterbrunnen*, in German, signifying *many springs*.

After mounting above three hours, we reached a small hut, which in summer is inhabited by herdsmen, who make excellent cheeses, and tend numerous herds of cows, goats, and swine. Here we feasted upon cold chamois, which our host had provided for us, and concluded our repast with a desert of delicious cream. From thence we ascended still further, with considerable difficulty arrived at the borders of the glaciers, and were entirely surrounded by rugged and almost impassable rocks. We wished to proceed; but our host assuring us, that we had but just time to return before night, we sat down close to the ice, and contemplated, with rapture and astonishment, part of the great central chain of the alps; rocks towering above rocks, and mountains rising above mountains, not more distinguished for their stupendous heights, than for the immense variety and rudeness of their forms. One of the peaks, which is called the Gross-horn, is of a pyramidal shape, and capped with frozen snow; another, the Breit-horn, is conical, and seems crowned with an enormous mass of transparent ice, from which the reflection of the sun-beams were inexpressibly beautiful. But the most elevated and most majestic of the whole group, is the Jungfrau-horn, or Virgin's-horn, which takes its name of *virgin*, because its summit is inaccessible⁴.

The hollows between the mountains are filled with large vallies of ice, broken into a great variety of shapes; and several torrents bursting from

⁴ The inhabitants call *horns*, *peaks*, or *needles*, those mountains only which have been inaccessible from the remotest times, and when such as are become so since were yet passable. RAMOND.

the snow, and uniting in their course, form the Weifs-Lutchine, a river which rolls rapidly through the valley of Lauterbrunnen, joins the Schwartz-Lutchine, which flows from Grindelwald, and falls into the Aar.

Many of the mountains are covered to a great height with verdure, on which the eye reposes with delight amid the horrors of such wintry scenes. We observed also, at considerable elevations, several small villages, the access to which must be almost as difficult as to the glaciers to which we ascended.

Notwithstanding, however, the magnificence and variety of this curious scenery, and the uncommon phenomenon of ice and snow in the midst of summer, bordering on forests and cultivation; yet I must own, that the ideas which we had previously conceived, from exaggerated accounts, concerning the boundless extent and magnificent appearance of the glaciers, were not sufficiently answered. And it is remarkable, that every object in Switzerland has more than gratified our expectations, except the glaciers; which must, nevertheless, be considered as forming one of the most interesting phenomena in the whole country. This disappointment seems to have been occasioned by the turgid accounts which we had heard and read of the glaciers of Grindelwald and Lauterbrunnen: and we were led to suppose, that the glacier of the Furca was much inferior in magnitude to those of Grindelwald and Lauterbrunnen; whereas, in fact, it was in all respects equal, if not superior, to them.

P O S T S C R I P T.

September 1, 1785.

In 1785, I was considerably more delighted and astonished with the vallies of Grindelwald and Lauterbrunnen than in 1776; because my imagination was not, in this as in the former instance, exalted by exaggerated descriptions, and led to expect more than could be reached, even by nature herself, however prodigal in these her sublimest works. But the vallies of ice appeared to me, in the latter as well as in the former period, inconsiderable objects, when viewed at some distance, and compared with the surrounding mountains, whose summits and sides are clothed with vast regions of ice and snow. On a nearer approach they become more interesting, particularly when they are broken into abrupt ridges, and immense chasms; and when their aggregate mass, and numerous branches, are observed from the surrounding heights. Still, however, the traveller may be disappointed, whose imagination has been previously filled with turgid descriptions; or who applies to the vallies of ice that sublimity and magnificence, which are only due to the alps above and around them.

The Translator's Observations.

As I was traversing the valley of Lauterbrunnen an idea recurred to me, which had been formerly suggested by the view of other similar vallies.

This valley is about five leagues long, and very narrow, resembling very much a deep chasm formed in a mass of mountains and straitened between the vertical walls of the cleft. The enormous pile of rocks on the right is higher
and

and more craggy than the chain of mountains on the left; and it is rather singular that the most considerable torrents which fall in broad cascades into the valley, should rush down from this wall alone, while none descends from the mountains on the left. Having, on a closer examination, found, on both sides, not only elevation answer to elevation, and depth to depth, but also the bed of the rivers continued from one side to the other, I was naturally led to consider this valley as an accidental crevice formed by some revolution that happened in this mass of mountains, by which the rivers which all flowed from the right to the left, lost ground at the same time, and poured their waters down into the gulf that opened before them. The gap, probably, less broad at first, widened gradually by the successive falling of the ground and rocks, producing those hillocks, or rather heaps of broken rocks confusedly mixed, that rise all along the walls. Towards the glacier the valley contracts itself: the two *Steinberg* which I passed, are, as their name imports, accumulations of broken stones, and the hill in the narrowest part of the glen and in the centre of the glacier, is nothing but a mass of ruins consisting of the different kinds of stones, metallic earths, pyrites and crystals whereof the neighbouring mountains are composed. Here I looked for volcanic productions, but my researches having been very superficial, I could not hope for much success.

From the bottom of this valley, one might enter into the Vallais by a pass between two mountains, which is now choked up by the ice. The last who ventured through this pass were some Vallaisans, who, persecuted on account of their religion, fled from their country in 1712. Since that time these regions are become every year more and more desolate and inaccessible. In 1778, however, the indefatigable Mr. *Bourrit*, author of two journeys round the Mont-Blanc, who is now publishing an instructive work, the precious result of his tours over the Alps, has found a lateral egress ranging along the mountains which divide this part of the canton of

Berne from the Vallais, and falling perpendicularly on the passage of the *Kandersteg*; and travellers as daring as he, may now from the bottom of the valley of *Lauterbrunnen* ascend the *Gemmi*, without being obliged to take the long circuit which Mr. *Coxe* mentions. In this passage Mr. *Bourrit* discovered a large and magnificent piece of water, situate in the most dreary solitude. According to Mr. *Wytttenbach* of Berne, and Mr. *Wolf* of Soleure, who have measured the fall of the *Staubbach*, by means of a rope to which there was fastened a very heavy lead, its height is in its lowest part nine hundred feet. The upper part presents a singular phenomenon, which it is equally difficult to describe as to paint; where the torrent issues from the channel which pours it into the valley, the wind seizes some small streams which are too light to rush down with the whole sheet, and driving them about for a long time before they are dispersed in rain, exhibits to the view the surprising spectacle of a small stream, floating like a silver riband in the air. The greatest part of the *Staubbach* is turned into a fog, moistening far and wide the meadows, and into clouds which rise into the atmosphere; were it not for the eminence which about the middle of the fall intercepts a portion of the waters already reduced to rain, nothing would come down on the earth but a light vapor. This intercepted portion flows gently down the declivity of the rock, and forms at the foot of the mountain a small rill, the imperceptible remains of a pretty considerable river. There blows continually near this fall, a high wind, which is very violent below. In winter the torrent withstands the frost for some time, but when it is very cold, the drops of water are congealed into globules of hail, and show in a sensible manner the formation of that meteor in the atmosphere. This hail rattles in the air, and foretels the freezing of the whole torrent, which soon looks like an enormous icicle, hanging from the edge of the channel, and increasing until it falls, by its proper weight, on the heap of ice below, with a noise far exceeding that of thunder or the avalanches.

L E T T E R 33.

*Lakes of Thun and Brientz — Passage of Mount
Gemmi — Baths of Leuk.*

THE nearest route from Lauterbrunnen to the Baths of Leuk, leads across the mountains to Kandersteg. It is called *le chemin vert*, or the *green way*, because the rocks are, for the most part, covered with herbage. It is only practicable to foot-passengers; and I was informed by a Swiss gentleman who passed it, though steep and difficult, that it is not dangerous. Its distance may be about three leagues, and, to a person not wholly unaccustomed to alpine passages, would require about five or six hours. A *chasseur* would perform it in less than half the time. In my second expedition, in 1785, I had proposed crossing this way; but was obliged to decline it, as I could not procure a guide who was acquainted with the road.

I pursued, therefore, the usual route, which runs from the entrance of the valley of Lauterbrunnen, through a fertile plain, between the lakes of Thun and Brientz. About two leagues from Lauterbrunnen, I came to the Aar, near the spot where it issues from the lake of Brientz, and followed its course until it entered the lake of Thun, so called from a town of that name, situated upon its north-western extremity. This lake is about four leagues long and one broad; and, if we may judge from the steepness of the mountains with which it is bounded, must be

very deep: the borders are richly variegated; and present several fine points of view, greatly heightened by many rugged rocks rising boldly from the edge of the water. We coasted this lake, through a delightful country, to the small village of Leisigen; then ascended to *Æschi*, from whence we looked down upon the lakes of Thun and Brientz. In all the maps of Switzerland, which have fallen under my observation, these two lakes are represented as if they extended almost in a strait line; whereas they are situated nearly at right angles to each other.

Having descended from *Æschi*, we soon entered the rich valley of Frutigen, parallel to that of Lauterbrunnen, and enjoyed, for a considerable way, a prospect of those glaciers we had visited the day before. This valley ends at the small town of Frutigen: from thence commences that of Kander, watered by a river of the same name, and bounded by mount Kander. In all these vallies, the rudeness and height of the mountains, which almost enclose them, contrasted with the beauty and fruitfulness of the plains, always fertilized by some lively torrent, form a thousand picturesque scenes, ever changing, and impossible to be described: and they are still further embellished by the number of ruined castles perched upon points seemingly inaccessible.

The road continued good as far as the village of Kandersteg; from whence delicate travellers, who do not chuse to mount a rugged ascent, either on foot or on horseback, are carried in an arm-chair supported by means of poles upon men's shoulders. We proceeded, however, on horseback, having before rode up steeper and more

difficult paths. After having ascended about an hour and a half, we arrived at the summit of the Kander, where a wooden cross marks the entrance into the Vallais; then traversed a waving plain of pasture; in which we observed a few huts and several herds of cattle; and at length reached a single house on the Gemmi, where we procured some refreshment: here we saw nothing but immense rocks piled upon one another, with no appearance of vegetation; and the weather was exceedingly cold. We then passed over a large drift of snow, and came to a lake called the Dauben See, about a league in circumference, supplied by a considerable torrent from a neighbouring glacier. This lake has no visible outlet; but doubtless finds a subterraneous passage into the *Vallais*.

The chain of mountains, which here separates the canton of Berne from the Vallais, is called the Gemmi: from the point of which, over-looking and almost over-hanging the Vallais, we had at once a most extensive prospect over that fertile country, and the rugged alps of Savoy. The mountain which we descended, is in many places almost perpendicular; and yet a horse-road has been hewed in the hard rock down this very formidable descent. It was begun in 1736, and finished in 1741, at the joint expence of the Vallais, and the canton of Berne: an astonishing work! which proves that nothing is impracticable to human industry. More than a league has been blown up with gunpowder, and a way formed which seems dangerous to those, who are unused to mountainous countries, or whose heads are apt to turn giddy. It is about nine feet broad, and quite hangs over the precipice: in some parts,

for a considerable space, it is a hollow way, open only at one side, the rock above projecting over it, of the same breadth, and in the same direction. The appearance is peculiarly singular: for, as the road winds continually, the scene also continually changes; so that one moment we commanded an extensive view, and the next were totally enclosed with barren rock.

The descent from the top to the plain, is about two leagues: when you are arrived at the bottom, and look up, you cannot observe the smallest traces of a road; so that a stranger would hardly believe it possible, that a passage has been formed down the rock, until convinced by his own experience.

About thirty years ago, the troops of Berne descended this road for the purpose of assisting the canton of Uri against the inhabitants of the valley of Levino, who had revolted; and, what is almost incredible, they descended with heavy artillery.

This place is famous for its hot medicinal springs; and is much frequented by invalids of various kinds, during this season of the year: the patients either bathe or drink the waters. As far as I can judge from the accounts which I have received concerning their warmth, their analysis, the method of using them, and their efficacy in curing the gout, rheumatism, obstructions, and cutaneous disorders; they seem nearly to resemble those of Bath. There are several springs, of different warmth and of different qualities: according to the most accurate experiments made by the Rev. Mr. Wyttenbach, the mercury in Fahrenheit's thermometer, when plunged into the principal source, stood at 115; and at 120 in the spring which flows near the bridge over the Dala.

The accommodations for the company are very inconvenient: each person having for his own use a small apartment not more than a few feet square; in which there is just room for a bed, a table, and two chairs. The public dining-room is upon rather a larger scale, as is also an apartment where the company occasionally assemble. Formerly the accommodations were tolerably good; but unfortunately, in 1719, an *avalanche* fell with such impetuosity from a neighbouring glacier, upon the village, as to overwhelm the greatest part of the houses and the baths, and to destroy a considerable number of the inhabitants.

The company, consisting of persons from different quarters of Switzerland, are exceedingly affable and obliging: insomuch that several of them have invited us to their respective houses; and this invitation was made with that openness and unaffected frankness so peculiarly characteristic of the Swiss. We dined this morning at eleven; the bell for supper is now ringing, and it is scarce seven. These are primitive hours: but we have travelling appetites; and, provided we meet with refreshment, the hour and place are of little consequence.

You are now probably drinking tea in your withdrawing room, from whence you are enjoying that beautiful prospect I have so often admired. The situation of this spot is more romantic than that of Bath, and the waters perhaps not less efficacious: yet this village contains only a few miserable houses, while Bath is one of the finest towns in Europe. I had a conversation to-day upon this topic, with a very ingenious and well-informed gentleman of the Vallais. I observed

to him, that, considering the great credit and efficacy of these waters, I could not forbear wondering, that the chiefs of the republic had not considered the improvement of the accommodations, an object worthy of their attention; for, if they were rendered more convenient for the reception of invalids, it would undoubtedly be the means of drawing a great number of strangers; and consequently must be highly beneficial to the country. He assured me, it had more than once been in contemplation: that some persons of great credit and authority opposed all improvements, upon a principle similar to the policy of Lycurgus; conceiving that a concourse of strangers would only serve to introduce luxury among the inhabitants, and insensibly destroy that simplicity of manners, for which the *Vallaisans* are so remarkably distinguished.

How far the ignorance of a people contributes to their true felicity? or how far a simplicity of manners may be corrupted by *national* improvement? are questions which have been much agitated; and will never be decided, so long as it shall be held just reasoning to argue from the abuse against the use. But it will readily be allowed, that superstition is ever the companion of ignorance; and that a people who are both ignorant and superstitious, must necessarily be benefited by an intercourse with nations more improved and enlightened than themselves.

We walked to a spot not far from hence, where a communication has been formed with the village Albenen. Where the mountain inclines towards a slope, a foot-path has been cut; but in those parts where the rock is directly perpendicular,

ladders are placed; and the peasants ascend and descend with heavy burdens upon their shoulders. We counted seven of these ladders. I mention this circumstance, not as being an object so remarkable, perhaps, as is represented by some travellers; but as it will convey to you an idea of the extreme ruggedness and singularity of the country.

I am, &c.

Part of the Translator's Journey.

The village and baths of *Leuk* or *Loiche* are built on a rising ground, within a valley, inclosed by three mountains, which are almost perpendicular, and give it the form of an acute-angled triangle, that has the *Gemmi* for its basis, and opens on the summit into the *Vallais* in order to pour down into the plain the *Dala*, a torrent which fills up the whole aperture. By their elevation, these baths enjoy, in the longest summer days, a view of the sky, and the presence of the sun, from eight in the morning till four in the evening; to the rest of the valley this luminary is only visible at noon. This situation is extremely cold; and in the finest days of July, when the wind blows down from the mountains, winter seems to descend on a sudden from the *Gemmi* with all his train of fogs, snow, and frosts.

The two mountains that form the sides of this triangle are on the West the *Syders* or *Cordona*, and towards the East the *Letschberg*, over which there was formerly a passage from *Berne* into the *Vallais*.

The waters of *Leuk*, like those of *Schinznach*, *Baden*, and other mineral springs in Switzerland are strongly impregnated with sulphur.

The baths are large reservoirs of water into which people enter without distinction; and notwithstanding this inconvenience, the want of accommodations, and the

wretchedness of the inns, they are always full of patients, chiefly such as labor under infirmities occasioned by old wounds.

The two principal avenues to these baths are that from Berne, over the *Kandersteg*; and that from the Vallais by *Leuk* or *Loiche*; this, although the easiest, is not passable for carriages, and very painful to people who are not accustomed to bad roads. Besides this latter there are two others which ascend from the plains of the Vallais, and range over the mountains; the first leads from *Salges* to *Inden*. Before my arrival at this last village I had a curious view of the adjacent country; after having mounted for a considerable time through a wild forest of pines, and reached the top of the mountain I found myself on the brink of an abrupt precipice, whose dreadful depth my eyes durst not fathom; before me was the *Gemmi*, terminating in three towering points; under it, between the mountains, there is a gloomy dell resembling a gulf; this is the valley of the baths, whose bottom the eyes can hardly reach; on my left I saw the village of *Inden*, lying on a vast platform, separated from the summit on which I stood, by the gulf; and on my right *Albinen*, an other village whose situation is so declivous, that one might roll from its streets down into the precipice. This village has no other communication with the valley of *Loiche* but by a series of eight very long ladders, fixed perpendicularly to the schistous rocks, which connect the different parts of the most horrid path; I doubt whether Mr. Coxe has examined it closely. A traveller who looks upon the passage over the *Furca* as dangerous, and who shudders at the remembrance of a way winding along the glacier of the *Grindelwald**, would not have spoken so calmly of one of the most frightful paths in Switzerland.

From this height I stept down to the bottom, by a way similar to that of the *Kandersteg*, not improperly called the

* See Letters *xxviii* & *xxxi*.

Galleries; it is a long zigzag cut into the perpendicular rock. This way has but lately been substituted to a series of ladders, similar to those of *Albinen*, down which some robust highlanders carry the infirm, whom they fasten on their back, and cover their faces, in order to hide from their eyes the horror of this manner of travelling.

The other road winds on the opposite side of *Inden*, and leads directly to the village of *Leuk*, it impends over a precipice in the bottom of which the *Dala* rolls its waves. At the entrance of the valley I crossed a torrent over a wooden bridge raised several hundred feet above the water, by which the two mountains are joined.

All along the perpendicular side of the mountains towards the West I observed a kind of conduit about two leagues long, consisting of wooden pipes, propt and fastened to the wall by iron bars, fixed in the rock, by workmen who are let down by ropes from the brow of the mountain. The aqueduct serves for a path to the peasants that will go from one mountain to an other by the shortest way. There are many such communications in the mountainous parts of the Vallais, where the steepy schistous rocks which are very apt to crumble, particularly on the south side, and the deep clefts, preclude the formation of a path.

L E T T E R 34:

*Republic of the Vallais — Cardinal Schinner —
Town of Sion — Martigny — St. Maurice.*

Sion, August 19.

SION being nearly the point where the German language terminates, and where the French begins; the natives in this part of the Vallais consequently speak both tongues.

We set out this morning at five, and came down a very steep valley to Leuk, a small town built upon an eminence near the Rhone: that river is here very rapid; and, if we may judge by the breadth of the channel, often overflows its banks. We crossed it at this place, and continued for some way through a forest of firs, till we again passed the river to Siders: from thence we coasted its banks to Sion, the capital of the Vallais.

Another road leading from the Baths of Leuk to Siders, which I traversed in 1785, though more steep and incommodious, is far more interesting to the traveller, who delights in picturesque views. It is called the *galleries*; is cut along the sides of an abrupt and rugged rock, in a zig-zag direction, and bounded by a wooden railing, which overhangs a dreadful abyss, so deep and obscure, that the river Dala, which rolls impetuously through it, is neither seen nor heard. The opposite chain of mountains is clothed with dark forests, enlivened with pastures, and interspersed with occasional villages, which are situated one above the other, to a considerable height, and seem scarcely accessible but to foot-passengers.

This tract of country, called the Vallais, stretches from east to west about a hundred miles; and contains about 100,000 inhabitants, who all profess the Roman Catholic religion. It is divided into Upper and Lower Vallais: the former reaches from the Furca to the Morge, below Sion; and the latter from that river to St. Gingou, situated upon the lake of Geneva.

The Upper Vallais is sovereign of the Lower Vallais; and comprises seven independent *Dixains* or commonwealths; namely, Sion, Goms, Brieg,

Visp, Leuk, Raren, and Siders; of these Sion is aristocratical, and the others democratical. They are called *Dixains*, because the Upper Vallais being divided into seven, and the Lower into three districts, each division is a *dixain*, or *tenth* of the whole.

The bishop of Sion was formerly absolute sovereign over the greatest part of the Vallais; but his authority is at present limited to the following particulars. He has the sole power of pardoning criminals⁵; and signs all the warrants for execution: the money is coined in his name, and with the arms of the republic. In his acts he signs himself bishop of Sion, prince of the German empire, and count and prefect of the Vallais: in days of high ceremony he dines in public, and is waited upon by the first noble of the Vallais, who is hereditary treasurer. He nominates also the bailiffs or governors of the two bailliages of Martigny and Arden; and he possesses considerable influence from his patronage of church preferment. Upon a vacancy in the see, the canons of the chapter of Sion present from their own body four candidates, from whom one is appointed bishop by the *Landsrath*, or general diet.

The seven dixains form, conjointly with the bishop, the republic of the Vallais; and all affairs are transacted in the diet, called *Landsrath*, which meets twice every year at Sion. This assembly consists of nine voices; the bishop; the *landshauptmann*, who is chosen or confirmed by the

⁵ To this power, so becoming an ecclesiastical prince, is annexed the disgraceful right of erecting the gibbets, and appointing the hangman, who wears his livery, and cannot be employed by the secular justice without an order from him. R.

diet every two years; and the seven communities. The bishop presides, and the *lands-hauptmann* collects the votes; and all resolutions are decided by the majority. Each *dixain*, although it has but one vote, sends as many deputies as it pleases: they generally consist of four; — a judge, a banneret, a captain, and a lieutenant. The judge and the lieutenant are appointed every two years; the two others hold their offices for life.

In all civil causes of a certain importance, an appeal lies to the diet in the last resort, from the inferior courts of justice in the several *dixains*. Thus, by the institution of this supreme council, the several communities in this country are firmly united, and form in conjunction one body politic, or republic, for the general affairs of the nation. In other cases, each of the commonwealths is governed by its own particular laws and customs.

Both the Upper and Lower Vallais were formerly dependent upon the bishop of Sion; but the inhabitants of the two districts united in order to limit his power; and, having succeeded in the attempt, they quarrelled among themselves for the superiority. A bloody war ensued; which terminated, in 1475, by the total defeat of the Lower Vallaisans. Since that period, they have continued subject to the Upper Vallais; enjoying however some very considerable privileges.

The republic of the Vallais is an ally of the thirteen cantons; and has formed a particular league with the seven Catholic cantons, for the defence of their common religion.

The bishops of Sion had formerly a considerable influence over the political affairs of Switzerland; and Matthew Schinner, the cardinal bishop, is

famous in history for his great abilities, his daring spirit of intrigue, and his turbulent and restless ambition. He was born at Milbach, in the diocess of Goms; and in 1500 was appointed bishop of Sion. It was entirely owing to his representations and influence, that the Swiss troops gave a singular instance of infidelity to their public engagements, by breaking a treaty which they had just contracted with Francis the First. When that monarch invaded the Milanese, he endeavoured to gain the Swiss; who having taken the duke of Milan under their protection, were the only obstacles to the progress of his arms. After much hesitation, they were prevailed upon, by the offer of considerable subsidies, to enter into a treaty: but the alliance was no sooner concluded, than the cardinal of Sion persuaded them to break it, and continue the war. The Swiss historians however record, with triumph, the patriotic conduct of two officers upon this occasion; who, remonstrating against this breach of faith, drew off eight thousand troops; and returning to Switzerland, in some measure retrieved the honor of the nation.

The remainder of the army, instigated by the plausible and artful eloquence of the cardinal, engaged Francis the First near Marignano, in one of the most furious and obstinate battles that was fought during the bloody wars of Italy. Night alone put a stop to the engagement, without separating the combatants; both armies were blended upon the field of battle: and Francis slept upon the carriage of a cannon, at no great distance from a battalion of the enemy. At day-break the Swiss renewed the charge with their usual courage, and were received with equal

bravery. At length the intrepidity of the king, and the desperate valor of the French, rose superior to the furious and repeated attacks of the Swifs; the latter retreated to Milan, leaving Francis in possession of the field of battle: an advantage, however, which he gained by the loss of his bravest troops.

The same cardinal, actuated by the most inveterate enmity to the French, occasioned also, by his sole intrigues, the loss of the Milanese to Francis. Lautrec, in the year 1521, commanded a body of 12,000 Swifs, who formed the principal strength of his army. On the other side, the cardinal had obtained, by his influence over his countrymen, a secret levy of the like number, to join the enemies of France: and thus, for the first time, the Swifs were seen combating under opposite banners, and ready to commit hostilities against each other. Upon this occasion the cantons immediately dispatched messengers, with peremptory orders for the Swifs in both armies, to return to their country. The cardinal bribed the messengers to conceal these orders from the Swifs in the army of the confederates, and to deliver them only to those who were in the French service. The latter obeyed accordingly; and this desertion weakening the army of Lautrec, Milan, and the principal towns, surrendered to the confederates. Soon after this instance of his intrigues and influence, the cardinal ended his turbulent life in the conclave, which assembled on the death of Leo the Tenth, for the election of a new pope.

The inhabitants of this part of the Vallais are very much subject to *goitres*, or large excrescences of flesh that grow from the throat, and often increase

increase to a most enormous size : but what is more extraordinary , idiocy also remarkably abounds among them. I saw many instances of both kinds as I passed through Sion : some idiots were basking in the sun with their tongues out , and their heads hanging down ; exhibiting the most affecting spectacle of intellectual imbecillity that can possibly be conceived. The causes which produce a frequency of these phenomena in this country , is a curious question , which very much excites my inquiry : but I shall defer giving my opinion , until I shall have obtained farther information.

The weather in this enclosed vale is so exceedingly hot , that I am at this instant , although the evening is far advanced , quite oppressed with the extreme fultriness. This languid heat is probably one of the causes , which occasion the inconceivable laziness and indolence of the inhabitants : much , however , must at the same time be attributed to the richness of the soil ; which prevents labor by almost spontaneously producing the fruits of the earth. In fact , the people assist nature very little : we passed several vineyards , in which the vines were suffered to trail upon the ground ; whereas , if the branches were properly raised and supported , the owner would be well rewarded by the superior quantity and quality of their produce.

The uncleanness of the common people is disgusting beyond expression. I have just been holding a conversation upon this subject with my landlord ; who , though himself a notorious example , yet severely censured the dirtiness of his countrymen ; and seemed to assign it as one cause of *goitres*. This assertion induced me to consider

the person of my host with somewhat more attention, in order to discover how it stood with himself in that respect; and I was rather disappointed to find, that he proved an exception to his own remark. Let me not, however, be understood as insinuating that the inhabitants in general are either goitrous, idiots, indolent, or dirty; like that traveller who asserted, that all the women of a certain town were crooked, red-haired, and pitted with the small-pox, because his landlady happened to be so. Indeed, I look upon national reflections in general, to proceed from the narrowest and most illiberal turn of mind; and have always been cautious not to judge of the physical, or moral character of any people from a partial and superficial view. But as to the singular prevalence in the present instance, of goitres and idiocy, it is a fact which I can venture to affirm, both from my own experience, and from various conversations I have held with several men of learning and observation of this country; and the general dirtiness and indolence of the common people are too notorious to escape the observation of the most careless traveller.

Sion is situated near the Rhone, at the foot of three insulated rocks, that rise immediately from the plain. The highest, called Tourbillon, supports the ruins of the old episcopal palace, still containing two or three untenanted apartments, in one of which are the portraits of the several bishops. On the second rock, denominated Valeria, are observed the remains of the old cathedral, and a few houses belonging to the canons. On Mayoria, the third rock, stands the episcopal palace, an ancient edifice of stone, built

in 1547. On seeing the apartments, I was greatly struck with their plainness, and could not avoid reflecting with pleasure on the simplicity of manners, which must necessarily prevail in this country; when the rooms, inhabited by the sovereign, instead of bespeaking the magnificence of a court, are scarcely superior to the dwelling of a peasant. Two apartments principally engaged my attention. The first is that in which the Diet assembles: at the upper end are two armed chairs for the bishop and the *lands-hauptmann*, and on each side a row of smaller seats for the deputies of the seven *dixains*. The other apartment is the hall, in which the bishop holds his court, like the feudal lords of ancient times: at the further extremity is a raised seat, called a throne, surrounded by a wooden balustrade; and, as an incitement to wisdom and impartiality, the figures of Justice, and Solomon's judgment, are coarsely painted upon the walls.

Sion is an ancient town, and was formerly the capital of the *Seduni*, who inhabited this part of the country in the time of Julius Cæsar. A few remaining inscriptions still prove its antiquity; and, among others, so obliterated that I was not able to decipher them, I observed one which was more legible: it is in honor of the emperor Augustus, during his eleventh consulship. In this inscription the town is called *Civitas Sedunorum*.

At Sion we parted with our horses and guides, who had accompanied us from Altorf; and procured a piece of luxury, to which we had been for some time unaccustomed; I mean a coach. But, notwithstanding the concentrated heat of the climate, and the great sultriness of the air,

I prefer riding or walking; as by that means I enjoy a more unobstructed view of the country: and indeed the scenes are so beautiful, and so perpetually changing, that the attention is every moment engaged by a variety of new objects that strongly demand admiration.

Upon entering the Lower Vallais, I perceived as much uncleanness, but a greater appearance of industry; and I am informed, that the natives are not altogether so indolent as the inhabitants of Sion and its environs.

This imputation of indolence will not hold good with respect to all the inhabitants of the Upper Vallais: for in the eastern part of that district, which we entered after having crossed the Furca, the soil, though far inferior in richness and fertility, was much better cultivated; and the people seemed industrious. Some physical reasons may be assigned for this difference: for, *there* the weather is not so sultry, the water is not unwholesome, and the air is remarkably salutary. Accordingly, upon our first entering the Vallais, we did not observe any of those goitrous persons or idiots, who struck us so much in the midland parts.

We stopped at the village of Martigny, which, according to antiquarians, was the ancient *Oclodurum*. It is said, that near this place may be traced the site of Sergius Galba's camp, one of Julius Cæsar's lieutenants, who was sent by that general to subdue the *Veragri*, the *Nantuates*, and the *Seduni*; the ancient inhabitants of these districts. It seems evident indeed from Cæsar's description, in the third book of his *Commentaries*, that *Oclodurum* could not be far from the present situation of Martigny; which stands in a

small plain, encircled by high mountains, and divided by the Dranse, that falls into the Rhone. I cannot however ascertain from my own observation, whether any traces of a Roman encampment still remain; nor could I gain the least information from the inhabitants; so that the conjecture concerning the situation of *Octodurum* rests only upon the faith of antiquarians, and on the general position of the country.

Martigny is a place much frequented by travellers: it leads to the valley of Chamouny, to St. Maurice and the lake of Geneva, and is the passage of the merchandize, which is conveyed over the Great St. Bernard into Italy. Near Martigny we passed under the majestic ruins of La Bathia, an old episcopal castle, standing upon the summit of a craggy rock, and impending over the impetuous Dranse. The road from hence to St. Maurice runs under a chain of rocks, the Rhone flowing at a small distance through the middle of a fertile vale. Having crossed the Trient, a turbid torrent which issues from a narrow and obscure glen, remarkable for its rugged and romantic scenery, we arrived at the Pisse-Vache, a cataract much noticed by travellers. The characteristic beauty of this fall is, that it seems to burst from a cleft in the middle of the rock, through hanging shrubs that start abruptly from the crevices, and forms a perpendicular column of water about two hundred feet in height. The body of water being very ample, and the elevation not so considerable as to reduce it entirely into spray, render the effect very striking. I enjoyed also the additional pleasure of seeing the sun rise opposite to this water-fall. The regular expansion of the rays enlightening the

different parts of the column of water; and the gradual descent of the rainbow formed by the spray, were inexpressibly beautiful. These torrents are my delight: but perhaps they recur too often in my letters to continue to be yours. Formerly travellers passed close to the Pisse-Vache; but a few years ago part of the rock falling down totally obstructed the road, which now runs through the middle of the valley. I traversed on foot, not without some difficulty, amid the fallen fragments, where, on a former occasion, I had passed in a carriage⁶.

At the extremity of the Lower Vallais, the two chains of mountains that bound this country, approach towards the Rhone, which nearly fills the interval between them. In this spot is situated the town of St. Maurice, built almost totally upon the rock, at the foot of some steep mountains, and at a small distance from the river. Its ancient appellation was *Agaunum*: it takes that of St. Maurice from an abbey, erected in the beginning of the sixth century, by Sigismond king of Burgundy, in honor of a saint, who is supposed to have suffered martyrdom in this place. This saint was the leader of the famous Theban legion, which is recorded to have been massacred by order of the emperor Maximin, for not renouncing Christianity. This history has given rise to much

⁶ *Pisse-Vache* is the common denomination of a waterfall in Switzerland. The torrent which forms this, is, if I am not mistaking, the *blackwater*, whose perpendicular fall is about ninety feet. Its noise is much like the roaring of thunder; and the wind which it produces so violent, that it drives clouds of spray at a distance of four hundred feet into the plain, where the condensation of the aqueous vapor forms several streams. R.

controversy: while some authors have treated it as a mere forgery; others have contended for its authenticity, with as much warmth and zeal, as if the truth of Christianity depended upon the decision. Without entering into the merits of the question, I cannot but remark, that the cause of Christianity has suffered more from weak and imprudent defenders, than from the sharpest attacks of its most inveterate adversaries. Indeed, the question concerning the number and sufferings of the martyrs, has occasioned much idle disputation: for, reduce the popular accounts of both as low as probability can reasonably carry them, there will still remain sufficient evidence of the wonderful constancy and calm resolution of those primitive victims: and whether a hundred thousand, or only fifty, suffered for the cause of Christianity, it will equally stand upon the same firm and immoveable foundation. Nor is the inquiry more material concerning the motives that actuated its powerful and cruel adversaries. It matters not whether Decius ordered the Christians to be massacred, because they had been favored by his predecessor Philip, or from his attachment to the Pagan rites; whether Maximin persecuted them from interested motives; Dioclesian as introducing innovations in his government; or whether Constantine protected them from conviction or policy. For the truth of Christianity is in no respect affected either by the imprudence of its early professors (if with any they were justly chargeable) or the political reasons that influenced the conduct of those emperors.

A few Roman inscriptions, chiefly sepulchral, and two defaced columns are the only

uncontroverted remains of the antiquity of St. Maurice. It is principally distinguished as being the chief entrance from the canton of Berne into the Vallais. This entrance is formed by a narrow pass, so strongly fortified by nature, that a handful of men might defend it against a considerable army.

The stone bridge over the Rhone is much admired for its bold projection: it is of a single arch, and the span is a hundred and thirty feet. Half of this bridge belongs to the Vallais, and the remainder to the canton of Berne.

I am, &c.

LETTER 35.

Of the Vallais — Goitres and Idiots.

Trient, August 22.

I AM now writing from the village of Trient, on my way to Mont Blanc and the alps of Savoy. From the mountain of the Furca, its eastern boundary, two vast ranges of alps enclose the Vallais: the southern chain separates it from the Milanese, Piedmont, and part of Savoy; the northern divides it from the canton of Berne. These two chains, in their various windings, form several small vallies, watered by numerous torrents that rush into the Rhone, as it traverses the whole district from the Furca to St. Maurice. A country thus entirely enclosed within high alps, and consisting of plains, elevated vallies, and lofty mountains, must necessarily exhibit a great variety of situations, climates, and productions. Accordingly,

the Vallais presents to the curious traveller a quick succession of prospects, as beautiful as they are diversified. Vineyards; rich pasture-grounds covered with cattle; corn, flax, fruit-trees, and forests, occasionally bordered by naked rocks, the summits whereof are crowned with everlasting snow. This strong and striking contrast between the pastoral and the sublime, the cultivated and the wild, cannot but affect the mind of an observer with the most pleasing emotions.

As to the productions of the Vallais; they must evidently vary, according to the great diversity of climates, by which this country is so peculiarly distinguished. It supplies more than sufficient wine and corn for interior consumption: and indeed a considerable quantity of both are yearly exported; the soil in the midland and lower districts being exceedingly rich and fertile. In the plain, where the heat is collected and confined between the mountains, the harvest is usually finished in July: whereas, in the more elevated parts, barley is the only grain that can be cultivated with any success; and the crop is seldom cut before November. About Sion, the fig, the melon, and all the other fruits of Italy, come to perfection: in consequence of this singular variety of climates, I tasted in the same day, strawberries, cherries, plums, pears, and grapes; each of them the *natural* growth of the country.

With respect to manufactures; there are none of any consequence: and indeed the general ignorance of the people is no less remarkable than their indolence; so that they may be considered, in regard to knowledge and improvements, as some centuries behind the Swiss, who are certainly a

very enlightened nation. The peasants seldom endeavour to meliorate those lands where the soil is originally bad; nor to draw the most advantage from those, which are uncommonly fertile: having few wants, and being satisfied with the spontaneous gifts of nature, they enjoy her blessings without much considering in what manner to improve them.

Before I take leave of the Vallais, I shall communicate to you the result of my inquiries concerning the causes, which contribute to render goitrous persons and idiots so remarkably common in these parts: premising, at the same time, that I must stand greatly in need of your candor, when you peruse the following considerations on a subject so extremely complicated; and on which so many different opinions have been advanced by naturalists and physicians.

First, with respect to goitres. The notion that snow-water occasions these excrescences, is totally void of foundation. For on that supposition, why are they common in the midland and lower parts, and extremely unfrequent in the higher regions of Switzerland; and particularly what reason can be assigned, why the natives of those places that lie most contiguous to the glaciers, and who drink no other water than what descends immediately from those immense reservoirs of ice and snow, are not subject to this malady? Why are the inhabitants of those countries in which there is no snow, afflicted with it? For, these guttural tumors are to be found in the environs of Naples, in the island of Sumatra, and at Patna and Purnea, in the East Indies, where snow is unknown.

But as it would be needless to mention the various opinions on this subject, I shall at present confine myself to what, from repeated inquiries, from my own particular observations, and from positive facts, appears to be the *primary* cause of goitres.

The springs that supply drink to the natives are impregnated with a calcareous matter, called in Switzerland, *tuf*⁸, nearly similar to the incrustations of Matlock in Derbyshire, so minutely dissolved as not in the least to affect the transparency of the water. Will it be deemed improbable, that the impalpable particles of this substance, thus dissolved, should introduce themselves into the glands of the throat, and produce goitres? I ground this opinion on the following observations and facts.

To speak in general: during my travels through Europe, I never failed to observe that *tuf*, or this calcareous deposition, abounds in all those districts wherein goitres are common. I noticed goitrous persons and much *tuf* in Derbyshire, in various parts of the Vallais, in the Valteline, at Lucerne, Friburgh, and Berne, near Aigle and Bex, in several places of the Pays de Vaud, near Dresden, in the vallies of Savoy and Piedmont, near Turin and Milan.

To descend to particular instances. The inhabitants of Friburgh, Berne, and Lucerne, are much subject to guttural excrescences. With

⁷ The Porus of the older authors.

The Tophus glareoso-argillaceus polymorphus, of Linnaeus, 186. 1.

The Tophus polymorphus of Wallerius, Syft. vol. ii. p. 394.

The Tophi of Kirwan, p. 25, called *Duckstein* by the Germans.

respect to Friburgh, I observed that one of the principal springs which supplies the town with water, issues from a neighbouring stone-quarry, and has formed large depositions of *tuf* on the rock from which it bubbles. The pipes, also, which convey water to the public fountains at Berne, are extremely charged with the same calcareous sediment; and a gentleman, on whose veracity I can depend, assured me, that he is subject to a small swelling in the throat, which usually increases in winter, when he is chiefly resident at Berne, and diminishes in summer, on his removal to other places, where the waters are not loaded with *tuf*.

I was, moreover, informed by General Pfiffer, that at Lucerne all the waters, excepting one spring, are impregnated with *tuf*, and that the natives, who dwell near that spring, are much less subject to goitres than the other inhabitants; that the same difference is observed among the members of the same family, between those who drink no water but what is drawn from that spring, and the others who do not use that precaution. The General showed me also the tin vessel, in which water was every morning boiled for his use, and which was so speedily and thickly incrustated as to render it necessary to have it cleansed twice a week. The water which yields this deposition, is as transparent as crystal ⁸.

⁸ Although it appears that wherever there are goitres there is *tuf*-stone; yet the reverse is by no means true, that wherever the waters deposit *tuf*, there are *always* goitres. For perhaps the natives do not drink of the springs which are loaded with *tuf*; or that substance is not sufficiently dissolved in the waters; absolute solution being, perhaps, necessary to produce these swellings.

I may add likewise, that I visited many places which border upon those districts wherein goitres and *tuf* are frequent, and which have precisely the same situation and climate, yet whose inhabitants were not goitrous, and where I did not observe any appearance of *tuf*.

But the strongest proof, in favor of this opinion, is derived from the following facts. A surgeon, whom I met at the Baths of Leuk, informed me, that he had not unfrequently extracted concretions of *tuf-stone* from several goitres; and that from one in particular, which suppurated, he had taken several flat pieces, each about half an inch long. He added, that the same substance is found in the stomachs of cows, and in the goitrous tumors to which even the dogs of the country are subject. The same gentleman assured me, that in the course of his extensive practice, he had diminished and cured the goitres of many young persons by emollient liquors and external applications; that his principal method, in order to prevent them in future, consisted in removing the patients from the places where the springs are impregnated with *tuf*; and, if that could not be contrived, by forbidding the use of water which was not purified. He confirmed the report that infants are occasionally born with guttural swellings; particularly those whose parents are goitrous; and remarked, that one of his own children had at its birth a goitre as large as an egg, although neither he nor his wife, who were both foreigners⁹, were afflicted

⁹ In the former instance, goitres may, though perhaps erroneously, be esteemed hereditary; but in the latter, where the parents are both foreigners and not goitrous, can scarcely be derived from any other cause than the aliment of the mother.

with that malady. He had dissipated it by external remedies; and since that period, had invariably prohibited his family from tasting the spring waters, unless they were distilled, or mixed with wine or vinegar; by which means he was able to preserve them from those tumors in the throat, that were extremely common among the natives of the town which he inhabited.

Although it is by no means my intention to trouble you with the various opinions which have been advanced on this subject; yet it would be unjust to withhold from you that of M. de Saussure, whose accurate researches and profound investigation on philosophical subjects, deserve to be weighed with the greatest attention. That able naturalist, in a recent publication¹, attributes the production of goitres not to the waters, but principally to the concentrated heat of the climate, and stagnation of the air. He informs us, that in all his travels through the Alpine countries, he never observed goitres in any places, which are elevated more than 500 or 600 toises² above the level of the sea: he noticed them in those vallies where the heat is concentrated, and the air stagnates; and that they usually cease wherever the valley terminates, and the country expands into a large plain. With great deference, however, to his opinion, may I be permitted to observe, that the conclusion does not absolutely follow from these premises? For it may be remarked, that in places elevated more than 500 or 600 toises above the level of the sea, the springs are too near their

¹ See Voyages dans les Alpes, ch. 48. vol. ii. p. 480.

² 3200 and 3840 English feet.

sources, to have dissolved a sufficient quantity of calcareous matter, or so minutely as may be requisite for the generation of goitres; and that when the valley expands into a plain, the waters may deposit their sediment by mixing with the rivers and lakes, or by filtrating through the earth and gravel. But although the two causes mentioned by M. de Saussure do not produce, they may *assist* in producing, guttural excrescences, by relaxing the fibres, and disposing the glands of the throat to admit more easily the introduction of the impalpable parts which are dissolved in the water. For it is observable, that women and children, whose frames are more relaxed than those of men, are most liable to be afflicted with these swellings; and that the natives of those districts most remarkable for the size and number of goitres, are extremely wan and livid, much subject to intermitting fevers, and other disorders which are judged to proceed from relaxation. In fine, although the concentrated heat, and stagnation of the air, may be allowed to affect the human body to a considerable degree; yet they do not of themselves seem sufficient for the effect in question, without the intervention of some more powerful agent: and this agent *seems* to be the water; if the facts already stated, prove consonant to truth and experience.

It may be necessary, however, to obviate an objection which maintains, that goitres must rather originate from climate and situation; because foreigners, established in the country, are *never* afflicted with those tumors, while their children are no less subject to them than the natives. But is it an uncontrovertible fact, that no foreigner

has ever been afflicted with this malady? The question, I should presume, can scarcely be replied to in the affirmative. And all that can be established, with any degree of certainty, is, that foreigners are *less* subject to these swellings than their children or the natives. In this respect the answer is evident. Persons who usually settle in foreign countries are adults; and adults are doubtless much less liable than children to an endemial malady, whose operation is gradual, and which requires much length of time, before its effects are in the least visible. And it is remarked, that, among the natives themselves, those persons, who have escaped this disorder during their infancy, are seldom attacked by it to any considerable degree at a more advanced age.

In reasoning upon this, as well as on similar subjects, where a cause is sought for, capable of producing a certain effect; it is necessary to establish a primary and general cause, which *always* and *necessarily* exists, wherever that effect is produced; and to exclude those circumstances, which do not *always* and *necessarily* exist, wherever that effect is produced. Thus, in the present instance: If snow-water occasions goitres, wherever there are goitres, there *must* be snow-water; which is contrary to fact and experience. If the concentrated heat of the climate, and stagnation of the air, are *necessary* to the formation of goitres, those excrescences could never be formed where these causes are wanting; which is not confirmed by fact and experience. If waters, impregnated with *tuf*, or with certain calcareous substances, produce goitres; wherever there are goitres, the natives must

must drink waters so impregnated; and this *seems* agreeable to fact and experience.

The same causes, which generate goiters, *probably* operate in the case of idiots: for, wherever the former prevail to a considerable degree, the latter invariably abound. As such is the nice and inexplicable connexion between our bodies and our minds, that the one ever sympathizes with the other; it is by no means an ill-grounded conjecture, that the same causes which affect the body should also affect the mind; or, in other words, that the same waters, which create obstructions and goiters, should also occasion mental imbecility and disarrangement.

Although these idiots are frequently the children of goitrous parents, and have usually those swellings themselves; yet they are sometimes the offspring even of healthy parents, whose other children are properly organized, and are themselves free from guttural excrescences³. I observed several children, scarcely ten years of age, who had very large goiters. These tumors, when they increase to a considerable magnitude, check respiration, and render those who are afflicted with them exceedingly indolent and languid. Some persons have, in opposition to the opinion which I have ventured to advance, supposed, that the small guttural swellings, which are common in many other parts, and the large excrescences, which are more particularly observed in the Vallais, in the Valley of Aost and in some other places, do not proceed from the same

³ A genteel family from Berne, having settled in the Vallais, had, after a stay of some years in the country, an idiot child among several others which were very healthy. RAMOND.

cause, and are not the same disorder. But sufficient reasons have not been assigned for this opinion. During my expedition through the Vallais and other parts of Switzerland, I noticed some of all proportions, from the size of a walnut to almost the bigness of a peck loaf. As the same gradation may be also observed in the species of idiots; by a similar mode of argument, those who possess some faint dawnings of reason might be discriminated from others, who are totally deaf and dumb, and give no proof of existence but the mere animal sensations. Whereas it is probable, that in both instances, the greater or lesser disarrangement of the body or mind does not indicate a difference of complaint, but only greater or lesser degrees of the same complaint.

It is to be presumed, that a people accustomed to these excrescences, will not be shocked at their deformity; but I do not find, as some writers assert, that they consider them as beauties. To judge from the accounts of many travellers, it might be supposed, that the natives, without exception, were either idiots or goitrous: whereas, in fact, the Vallaisans, in general, are a robust race; and all that with truth can be affirmed, is, that goitrous persons, and idiots, are more abundant in some districts of the Vallais; than perhaps in any other part of the globe.

It has been asserted also, that the people very much respect these idiots, and even consider them *as blessings from Heaven*; which is strongly contradicted by other. Upon my questioning some gentlemen of this country, at the baths of Leuk, they treated the notion as absurd and false: but whether they delivered their real sentiments, or

were unwilling to confirm what might lower their countrymen in the opinion of a stranger, will admit perhaps of some doubt⁴. For having, since that time, repeatedly inquired among the lower ranks, I am convinced, that the common people esteem them as blessings. They call them "*Souls of God, without sin*:" and many parents prefer these idiot-children to those whose understandings are perfect; because, as they are incapable of intentional criminality, they consider them as certain of happiness in a future state. Nor is this opinion entirely without its good effect; as it disposes the parents to pay greater attention to such helpless beings. These idiots are suffered to marry, as well among themselves as with others.

I am, &c.

The Translator's Observations on the Vallais.

The two chains of mountains which surround the Vallais, separate at the *Furca*, to let out the *Rhone*, that takes its source there; and widening a little, hem in the lower part of the country between two walls of prodigious height, which below *St. Maurice* unite, leaving but a narrow opening which is shut by an iron gate watched by a guard. This aperture is the most commodious entrance into the Vallais; the other passages are by dangerous paths, very distant from one another, winding over high and craggy rocks, which as the Vallaisans apprehend, are threatened with a total obstruction by the ice, whose gradual progress, over this whole range of mountains, will one day shut them out from all communication with their neighbours.

The mountains of the lower Vallais offer a new spectacle to him, who, having not yet seen these enormous masses in

⁴ See the following observations. RAMOND.

their decrepitness, vainly fancied them eternal. Nowhere destruction has so menacing an aspect; and we behold with terror the powerful means it employs to shake these huge rocks, whose vast extent, instead of securing them from ruin, serves only to alarm the inhabitants with the consequences of their destruction.

That chain which is exposed to the North is far more decayed than its parallel. Nothing is to be seen there but towering cliffs, impending over dreadful precipices, deep hollows, filled with huge fragments of these mountains. The thick strata of clay and chalk, that invested the primordial kernel, burst in every direction, and threatening, by their entire disjunction, to bare the carcase of the Alps.

To this destruction, however, the lower Vallais is chiefly indebted for its luxuriant fertility. Without it this lower part would, like the superior, still be clad with that uncouth verdure which covers the tops of the high mountains, and is only fit for pasture. It is the heat of the sun, concentrated between these perpendicular walls, which renders the plain fruitful. On the ruins of these walls, the husbandman has driven his plough; and planted the vine into its genial soil; a forest sprung up from a vast tract that fell in; the sum total of the habitable surface increased; and on the uniform and barren declivity of the mountains there arose very soon an amphitheatre of platforms highly cultivated. Thus life rises from death. To form an adequate idea of this country, it must be looked upon as one of those ancient edifices whose form has been altered by destruction; the sun pervades its cold recesses; a smiling vegetation invests the gloomy rubbish; and innumerable families people its inclosure which had lain desolate for many centuries.

In a country like this we must of course find men struggling with nature, and I have every where seen traces of successful industry. In these mountains alone people learn to turn off a stream at its spring, to dam in an impetuous torrent; to make a path along a steepy rock; to carry brooks over

precipices, and to make them fertilize successively different platforms of several mountains. Very often, however, human art and strength, after having for some time successfully striven against the partial will of nature, are obliged to yield to her great commands. The old age of these mountains has its natural infirmities. I have seen their vallies abandoned to the fury of raging torrents. The lower Vallais, at the same time overflowed and parched, was deluged by the Rhone boiling under the sun in the dog days, and scorning all other banks but those formed by the chain of mountains which encompass this country, the theatre of its ravages. Obligated to quit the drowned fields, I sought a refuge on the heights. Here I enjoyed the finest and the most terrible spectacle. The plain at my feet, transformed into a vast lake, exhibited a picture of desolation. I saw villages and forests half overwhelmed, emerging from the bosom of the flood; ruins, extensive fields covered with gravel, sad monuments of the ravages of the river. . . . Higher up the scene was changed, and the sides of the mountains were besprinkled with burghs and hamlets, whose inhabitants beheld with indifference the havoc whose fury they had not experienced; here I saw harvests on platforms beyond the reach of the waters, vines laden with grapes ripening in the sun, whilst the heat of this luminary was feeding the destroyers of the villages, by stripping the mountains of their snow; and above this theatre of luxuriance, the summits mantled with eternal ice, the image of dreary winter. The same cloud which showered down the rain and darted the lightning over the plain, invested the tops with a new coat of snow; at one view I overlooked climates and seasons.

I left this region to visit the superior and Eastern part of the Vallais; here every thing changed as I ascended; the mountains stood nearer together, were higher and less decayed, with cattle grazing upon them; they resembled in every respect their neighbours. At *Brig* they are so close, that they seem to cross one another. Below this burgh I

discovered the remains of a pretended Roman wall, stretching from North to South; whose situation at the entrance of the passage would prove it, as I have observed above *, to have been one of those numerous and useless barriers, which that people opposed to the excursions of the highlanders.

Above *Brig* the valley contracts into a narrow and inaccessible precipice, over whose bottom the Rhone rolls its roaring waves. The road winding along the Northern mountains brought me into the most dreary solitude of the Alps. I walked above two hours without meeting with any habitation in a dangerous path overshadowed by gloomy forests, and impending over an abyss, whose depth my eyes attempted in vain to reach. This desert is very much infested by robbers, and the many human heads fixed on poles, on both sides of the road, sufficiently bespeak its insecurity. At last I arrived at *Lax*, a village situated in the wildest part of this sequestered region. The soil on which this village is built inclines rapidly towards the precipice, from whose bottom rises the full roar of the Rhone. On the other side of this abyss lies another village; and the churches of these two villages standing opposite to, and at no great distance from, one another, I could hear from the burying ground of the one the hymns sung in both, seemingly in unison. The melancholy of this mournful music was heightened by the hoarse murmur of the torrent, and the rustling of the leaves. Beyond *Lax* the prospect brightens, the mountains widen, and the precipice changes into a plain, which is the common avenue to the *Grimfel* and the *Furca*. The first of these mountains is very much frequented by the shepherds of the *Vallais*, the least industrious of men, when they are not roused from their indolence by necessity; who transport over it the hides which they do not know how to dress, and are obliged to sell raw to the carriers of Berne. On the summit of the *Furca* I saw those magnificent glaciers of which Mr. Core has

* See Let. xxx.

described the lower part *, and that have been very fancifully painted by different travellers, but which can only be compared with themselves. I found here neither enchanted palaces, nor ancient edifices; neither porticoes, nor vast flights of steps; and saw but one of the finest glaciers of the Alps, one of the most awful phenomena of nature. At the foot of this glacier are the sources of the Rhone, which had been for a long time unknown, and placed elsewhere by superficial travellers †.

Such is the Vallais and the formidable wall which encompasses it. Insulated, and uniting within its inclosure the gifts which nature bestows generally but on different climates, it seems destined to suffice to itself; if, however, among the circumjacent countries there were one with which it might have any intercourse, it would be Italy. Into this pleasant region the Vallaisans are invited by the most easy and open passages. But whenever they will trade to Switzerland numberless are the obstacles they meet with; the rocks are craggy, the precipices deep, the glaciers rise above one another, they are either obliged to seek a different issue **, or reduced to communicate with their ally by those passages only which their indefatigable industry has formed ††, and by outlets which are very rare in these mountains ***.

* See Let. xxviii.

† Ibid.

** The narrow pass of St Maurice, of which I have spoken above.

†† The passage of the Kandersteg, cut in the rock. See Let. xxxiii.

*** Such is the Grimsel which is passable during some months only, and seems to become every year more choked. See Let. xxix.

Considered in this view, the political state of the Vallais must appear very intricate to an observer accustomed to find in the partition which the different societies have made among themselves of the surface of the earth, indelible traces of the great divisions of nature; and he who knows that a river was sometimes sufficient to distinguish one nation from the other, and to separate for ever two empires, will not see without surprise the strongest barrier of the world oppose in vain the reunion of two nations.

But when, after this last view of the mountains of the Vallais, he descends into the plain, and finds the great difference between the manners of the Vallaisans and the Swiss; when, opening the annals of the country, he sees this nation formerly subject to other masters, and after different revolutions, subdued by other conquerors; when he is convinced that for each of these nations there existed a series of independent events; when he comes to perceive at last that they had not the same origin, and that in those remote times when the barbarians of these mountains, classed by the natural divisions of their country, passed the wall which separated them but to hurt one another, the inhabitants of the *Penine* vallies were at enmity with the Helvetians his astonishment will increase, and he will acknowledge that nature infringed her laws in favor of liberty.

Struck by the truth of these observations, and carried by the comparison it offers, up to that epocha, where history is mute, and where tradition, which supplies its insufficiency, mentions of all the different nations that peopled our Western continent but the Gauls, whose name is thought generical, being the only one that resounds in this universal silence; I see issue from our forests those innumerable colonies which overran in every direction the neighbouring regions. They cross the Rhine, the Alps, the Pyrenees. Different provinces of Germany, Upper-Italy, and Spain bear still the name of these new hosts which they were forced to admit. *Galicia*, *Walles* the country of the *Wallons* attest yet those first emigrations; and why should I not add the

Vallais, considering that at the foot of these Southern bulwarks every thing is of Gaulish origin, even the primitive orthography of its name*.

It is enough to point out these conjectures, I do not intend to examine the questions they give rise to. I shall content myself with observing, that I am probably inviting strangers into a country, from which nature had excluded them, as notwithstanding its bulwarks it is the first asylum in those mountains which the Romans, and after them the Franks and the Vandals have forced. It belongs not to me to inquire why this country has always been so easily conquered,

* The Germans call the *Vallais*, *Wallis*; which seems to be the name the Burgundians gave this country; substituting in the place of the Gaulish and Roman *g a w*. The relation between *Wallis*, *Walles* and *Wallon*, German words of Gallic origin, must be obvious to an etymologist; and he who knows the manner how the Northern nations changed the Roman consonants, will not derive *Wallis* from the *Vallis Penina* of the Romans, notwithstanding the seeming conformity of the two words; for the Latin *v* is changed either in hard *v* or *b* and never in *w* or in soft *v*. I will only add that probably the denomination of *Vallis Penina*, which the Romans gave to the *Vallais*, at a time when they knew it but as a valley of the *Penine Alps*, was afterwards changed into *Vallesia* or *Wallesia*; when the name of *Galles* or *Gallis* which had been given it, was transformed by the Vandals into *Wallis*. My opinion is supported by that of Mr. de Gebelin, though seemingly differing; he agrees that the second part of *Vallis Penina* was of Celtic origin, and a Gallic word; for *Penn*, which in Celtic signified an elevation, is found entire in the British *Penn*, head; and in the Spanish *Penna* a rock; not to mention the great number of French, Spanish and Italian words that are derived from it. When, therefore, the *Penine* summits, which form the Southern inclosure of the *Vallais*, have had in remote times a Celtic or Gallic name; when the whole chain of these mountains was known by this appellation, we must grant that this chain was well known to the Gauls, and that their language was spoken by the inhabitants of the country; and this would prove the communion between the two nations, if history and tradition did not attest it.

this is one of the many problems which the Vallais offers us to solve.

In a country subdued successively by the savages of the North and the West, by the barbarous and by the civilized Gauls, by the conquerors of the world, and by those hordes, that subverted their empire, we meet but with mixed races, and manners, and interrupted traditions; nothing primitive, nothing truly ancient is to be seen here. To these moral causes we must add the physical transformations, to which the Vallais, more than any other region of the Alps, seems to have been subject. Such as the destruction of its cold forests, and the denudation of the mountains. The number of the shepherds has decreased as pasturages have disappeared and farmers multiplied; and the inhabitants of the parched vallies forsook gradually the pastoral manners of the race to which they belonged, still subsisting in the Northern parts of the same chain of mountains.

I have already given a description of the pastoral manners of the inhabitants of the Alps, and showed the striking difference between the shepherd of Switzerland and the neatherd of the Vallais; from my comparison it follows, that among the Swiss there are still to be found many true shepherds, but very few among the inhabitants of the Vallais; for I cannot honor with this name the hirelings that tend the herds of a community. It is no doubt, for this reason, that I heard nowhere in the Vallais the *ranz des Vaches*, the favorite air of the Alpine shepherds. I cannot affirm however that it is quite unknown there; but it is certain that it has been almost forgotten in the greatest part of these mountains. The same has happened in Alsace and in Suabia, where the inhabitants have only conserved some parts of it*.

J. J. Rousseau has spoken of this famous tune, the charms it has for the inhabitants of the Alps, and the impression it made on

* I have heard it sung with some difference by the shepherds of the *Kochersberg*, a mountainous district of Lower-Alsace, remarkable for the fidelity with which its inhabitants have conserved their ancient manners.

such as heard is play'd out of their country*. A lively remembrance of their mountains, a deep regret to have left them, and a strong desire to visit them again, were the sentiments this simple air, which they had been accustomed to hear from their earliest youth, awakened in their soul, these sentiments produced a settled melancholy, which very frequently occasioned their death†. The Genevan philosopher observes, that the effects of this tune are no more so powerful since the Swiss have lost their primitive simplicity. I may add, that it is no more played so often because the number of shepherds diminishes. In this manner it was lost by degrees in most of the mountains adjoining to Switzerland; for there is no doubt but it must have been common formerly over a great extent; if we compare the different places, where there may be found traces of it; and if we consider that those places are always either lonely vales, or sequestered retreats; where ancient manners and customs have been conserved long after they had disappeared from the intermediate countries. The epocha when it was in vogue on the whole surface marked by the scattered cottages of the shepherds, who have conserved it, must be very remote, and is probably to be traced to those times,

* See his Dictionnaire de Musique.

† It was forbidden to be played among the Swiss troops in France and Holland. This prohibition reminds me of that of the fine Moorish romance, on the taking of *Alhama*; which exists still in Spanish, and begins thus:

*Passeavase el Rey Moro
Por la ciudad de Granada,
Desde las puertas de Elvira
Hasta las de Bivarambla;
Ay de mi, Alhama!*

Whenever it was sung, in the city of Granada, either in the Arabian language or the vulgar tongue, it is said to have caused such immoderate tears, that one should have thought every one has lost the dearest object of his love. Such is the power of poetry and music in their primitive simplicity.—We must not, however, confound these two instances. The Moorish romance operated as poetry, whilst the Swiss tune, as Rousseau remarks, works as a memorial sign.

when the herdsmen that peopled those regions, which have since been turned into corn fields, communicated together by the ridges of those mountains that terminate in the Alps. On this supposition the *Ranz des vaches* must be very old, nor can any German song be compared with it in point of antiquity*.

Although the power which this tune had over the hearts of the Swiss be no more the same, it has not yet lost all its rights, I might produce recent proofs of its effects in almost all parts of Switzerland, except the Vallais which offers, as far as I know, not one instance. Perhaps my researches were not exact enough; I invite therefore all those, to whom observations of this kind may seem interesting, to supply the insufficiency of mine; assuring them that their trouble will be amply rewarded. A day passed in a high pasturage of the Alps has its delight. Sitting on a high rock, in a circle of women who sing their old ballads, or tell the stories of their country, and the black enchantments to which they ascribe the great revolutions it underwent, you cannot attend without emotion to the simple and persuasive tale; you are tempted to believe, and wish to become as superstitious as they. Then let the shepherd take his reed. . . . If I am right, and that my judgment is not seduced by the custom of hearing this tune in such situations, the *Ranz des vaches* produces sentiments which no other song is capable to inspire.

* It has no regular melody, although its measure does not change; its movement varies several times, but not periodically; this singularity distinguishes it from all the ancient German melodies: its final resembles to none used at different times. It is not sung in a chorus, like all the German songs that are known, because the ear cannot catch easily the notes of accompaniment. In the last place, there is no ancient rhyme to it, though all the tunes even those of dances, that are played in this country have some. I am inclined to believe that it is but a dancing tune, so old however that its steps are forgotten; and the ancient dances in quintuple time, still in use on the *Kochersberg*, but nowhere else, may give us an idea of the oddness of the dances in this country.

Born in these mountains, it bears the character of its origin; the impression which it makes on the ear does not destroy the grandeur of the scenery which dazzles the eye; but we must only judge of its effect here; in any other part it would hardly affect us; its wild melody disagrees with our sensations, it is a stranger speaking but the language of his country*.

To this view of the history of the mountains which encompass the Vallais, and of the manners of the inhabitants, I must add a few observations on the people scattered over the different parts of this singular country. The Vallais and the manners of its inhabitants have been often described, but all those descriptions are too general, their authors boldly concluding by a part of the whole; which is, as Mr. Coxe says, a convincing proof of the levity of the observer. One, charmed with the simplicity of which characterizes exclusively the inhabitants of some sequestered vale, creates for the whole country a second golden age as fabulous as the first; another, frightened at the sight of the goiters in the environs of Sion, fills the whole country with *goitreux* and idiots; and what is worse, the first denies to the second his idiots, who in his turn contests him his golden age.

A numerous people spread over the vast and rugged surface of a country, whose diverse parts have undergone very different physical as well as moral revolutions, which, uniting several climates, offers all the varieties that are to be met with but in distant latitudes, cannot conserve

* The following pleasant story may serve to prove that the *Ranz des vaches* is still in great estimation among the Alpine shepherds. An inhabitant of the canton of Appenzel having composed a lyric hymn in honor of some saint, not finding, among the sacred and profane songs known in his country any tune expressive enough, had it sung to that of the *Ranz des vaches*, to the great edification of the parish, until some one, who thought himself wiser than the rest, took it into his head to observe, that it was indecent that the walls of the church should resound with an air, whose meanness could not be agreeable to a saint.

among its members the uniformity which nature has banished from the soil it inhabits; the shepherd differs widely from the husbandman; the highlander is very unlike the inhabitant of the plain. The Vallaisan who dwells at the foot of the *Grimfel* or the *Furca* is distinguished, by his manners as well as by his figure and language, from his countryman who lives in the environs of the *St. Bernard*, and neither of them can be confounded with the degenerate inhabitant of the centre of the same region.

Some general conformities constitute, however, a *kindred likeness* among these different tribes of the same nation; the principal whereof is a gentleness and softness of manners, resembling the innocence of the first age of the world, and perpetuating its credulity. It is the cardinal virtue of the Western and Southern Vallaisans; among whom hospitality is exercised in a more obliging manner than among the Swiss highlanders. An other general disposition, not less characteristic of this people, is an indolence more or less remarkable, but always apparent enough to distinguish them absolutely from the Swiss, and bring them nearer their Southern neighbours. This indolence which, among the inhabitants of the Eastern part is but a slight shade, assumes a more determinate character towards the centre of the Vallais; there it is a laziness and a dirtiness, which are so disgusting, that I very often preferred passing the night in a wet forest, to the shelter of a filthy cottage. The necessity of restraining the torrents, and of rendering the mountains accessible, could alone overcome this indolence, by giving birth to the only kind of industry naturalized in this country.

The inhabitants of the upper and Eastern part of the Vallais, are generally as handsome as the highlanders of Berne and Uri, but neither so lusty nor so courageous. The complexion of the women is fresh, their features pretty, and their skin white; but they deserve the reproach which the lover of Julia makes them; and the strong manner in which their contours are marked reminds us more of the Venus of

Rubens than of that of Praxiteles. The language which is spoken in this part of the Vallais and in the neighbouring canton, is a corrupt German, or rather the German of the thirteenth or fourteenth century. This dialect is common to the Swiss and the inhabitants of Suabia, ancient nations remaining faithful to their customs. The manners of these highlanders are little different from those of the Swiss, particularly of the inhabitants to the canton of Uri. Religion has as much influence as proximity on this particular resemblance.

Those that live in the Western part are just the reverse of these, resembling in figure, manners, and language the Savoyards of the Faucigny, their neighbours who inhabit the other side of the same mountains. They talk *Romansh*, a bastard idiom, sprung from the Latin, which had been for a long time the vulgar tongue of France, is still spoken in Spain, and which, by withdrawing from its source in different directions, has given birth to the particular languages spoken on the coast of the Mediterranean, from the banks of the ocean to the states of Genoa and Milan.

In the Southern vallies, in those retreats where few travellers have penetrated, we must look for that simplicity, for those patriarchal manners, which furnished to the author of *Julia* one of the most affecting pictures. There those primitive virtues sought a refuge when they fled before our refinements, and they will probably be soon compelled to abandon this asylum; for it is over with innocence as soon as it is observed. If you will, therefore, see a picture not of the *golden age* and of *fine nature*; but of *simple nature*, and of the probity of our ancestors, hasten to these happy vallies, but do not go out of them, to see whether the rest of the country resembles them; for out of these retreats every thing goes as in the rest of the world. You will find the great roads frequented by merchants and travellers; inns where you will be asked more for your victuals than they are worth; the woods infested by robbers, and the terrible marks of the

vengeance of justice on the summits of the mountains, which confute sufficiently the assertions of those who pretend that this country is the seat of innocence*.

Between the upper and the lower Vallais there is a large and level basin, which is often inundated by the Rhone, and ever scorched by the beams of the sun, reflected in every direction from the perpendicular walls of the neighbouring mountains. The sultriness is quite intolerable here; the thickest forests and the darkest shade can not fend it. Sion lies in this focus, where there is a continual circulation of tepid and penetrating vapors, adding to this troublesome closeness an enervating humidity. The houses are impregnated with it up to the highest stories; and the bishop alone, is in some degree sheltered against its baneful influence, by being lodged on the highest top of an enormous rock, rising from the middle of the town. The people of this district are the laziest, and the weakest of the whole Vallais; here it is that one meets with *goitreux* and idiots, about whom there have been so many disputes. I shall only add to Mr. Core's particular description of them, that among the great number of idiots which I have seen there are some whose imbecility may be

* The great many gibbets scattered over the whole Vallais, and the country of the Grisons, as well as the hideous objects which the governments of both states take care to keep continually in the eyes of the people, attest both the frequency of crimes, and the severity of criminal justice. I must declare that I could not discover in the conformation of those two political bodies, a sufficient reason for this moral distemper, so little known in the neighbouring republics. It must, however, exist in them; if what I have been assured be true, that the multiplicity of crimes in these two countries proceeds from their being the retreat of all the outcasts from the other cantons; this is an additional indication; and we must conclude from this preference, of which the physical situation of the countries offers no cause, that the evil arises from some hidden defect in the constitution.

looked

looked upon as the highest degree of stupidity of which human nature is susceptible. Nothing can awaken their intellectual faculties, even experience, the great teacher of all living creatures, leaves no traces on their memory, nor does example excite them to imitation. This, I think, is the height of moral insensibility. I must add here, that I have never seen any Vallaisan deficient in those attentions, which these weak creatures have a right to expect, this regard is founded on opinion; for children seldom capable of reasonable pity, and naturally inclined to insult these disgusting creatures, who would every where be objects of contempt, treat them with courtesy and respect. The sentiment which put these unfortunate creatures under the public safeguard is evidently the same which presided over the judgment of all nations when they joined in looking upon idiots and naturals as innocents marked by heaven to have no share in the crimes committed on earth, and destined to enter without obstruction into the mansion of rewards.

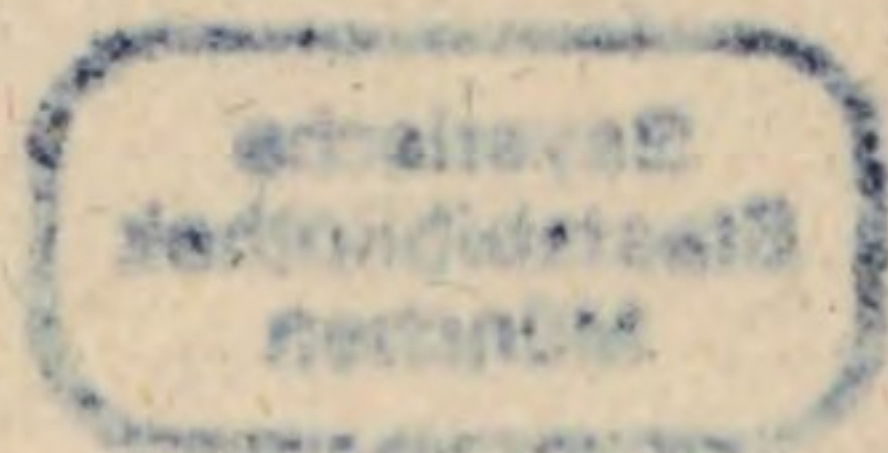
Like Mr. Core, I owe my knowledge on this subject more to the information I received from the common people, than to my conversation with those of higher ranks. I have found that discussions on this subject were not at all agreeable to the latter, many of whom are weak enough to regard as disgraceful to their nation, what the former count among the blessings of heaven*. Which of these opinions is the most respectable? Certainly that which secures to an unhappy portion of human kind the most obliging cares and the kindest regard; that tender concern which is so superior to simple compassion.

A description of the mineral productions of the Vallais might prove very entertaining, but would add very little to the civil history of a people who are too indolent to

* A sensible Swiss had warned me to treat this subject cautiously; that is, when speaking of it to people of rank, with contempt; and when to the common people, with respect.

explore the mines with which their country abounds. A few inconsiderable iron-works, erected in places hardly accessible, for the smelting of a small quantity of ore found contiguous to the surface of the earth, and depending on the scanty supply of coal from a small wood in the neighbourhood, is the *maximum* of the industry of the Vallaisans, whose ignorance in mineralogy disqualifies them for any enterprise on sure principles. I have seen a substantial man waste his fortune in reducing glimmer, in a place where I discovered among many other minerals a vein of cobalt.

Notwithstanding their ignorance, these people have some notion of the existence of mines of precious metals in their country. The inhabitants of the Upper-Vallais ascribe to the discovery of a vein of gold the immense riches of a peasant of Brig, who possesses a princely estate. The name of this man is *Stockhalber*; and the origin of the fortune of his family remounts about to the fourth generation. His great grandfather had iron-works; whether his skill and activity have turned them into a mine of gold, or that he really discovered a vein of this precious metal, he acquired in a short time considerable riches. A contract for supplying the country with salt which his wealth procured him, and which is said, he solicited in order to hide the source of his riches, contributed, no doubt, to their increase. The finest lands of the Upper-Vallais and that part of the Milanese, which lies between the capital and the *Furca*, came into his possession; and it is pretended that he might go from Sion to Milan without stepping out of his estate. The greatest part of it is still in the hands of his successors, notwithstanding the many persecutions which his family were exposed to after his death. His son having, either by his wealth; or his religion, at the time when the government were inclining towards the reformation; or by the detection some arms which had been concealed under his roof, or by his maintenance of above five hundred retainers, his laborers, given umbrage to his neighbours,



was compelled by the people, assembled at a general meeting, to make a declaration of his fortune, and fined to pay a crown per head*. This fine, though exorbitant for the time, would have been yet higher, if he had not weakened his declaration by a shrewd evasion of the terms of the oath that was exacted from him†. This mental restriction had been suggested to him by some jesuits. In return he built a church at *Brig* for his own use and that of the fathers, of whom his family continued to entertain six; till their order was suppressed, when they were succeeded by the same number of secular priests, who besides a very commodious habitation, with gardens and fields adjoining, and herds of cattle entertained at the expense of the founder, enjoy a revenue of six-hundred livres; a very considerable sum in the *Vallais*.

The present *Stockhalber* was not at *Brig* when I passed through the place; I have, however, been assured that with the wealth of his forefathers he also inherited their simplicity. Nothing distinguishes him from other substantial peasants of the country. Luxury has not yet found admittance into his family, who carefully avoid irritating the envy of their neighbours, his wealth is less visible in the choice of the things he uses than in their quantity. What alone distinguishes him at *Brig* is his church with his clergy, and the title of *Monfieur* which the people gives to the males of the family; a sort of flattery proving, that the poor are every-where more, ready to humble themselves, than the rich to grow proud.

* I have spoken of these fines per heads, in my observations on *Let. VI*.

† Forced to bring upon the altar his deeds, contracts, and precious effects, he found means to convey part of them in a hole contrived beneath; then laying his hand upon the heap, he swore confidently that all he possessed was under it.

L E T T E R 36.

Passage of the Tete Noire—Col de Balme—Mont Blanc—Its great Elevation.

Geneva, August 28.

UPON quitting Trient, we traversed some narrow vallies, through forests of pines, by the side of a small but impetuous torrent, which takes its rise from the glacier of the same name. The road, which is very rugged, is carried over the steep crags of a mountain called *La Tete Noire*. A little way from Trient we entered the duchy of Faucigny, subject to the king of Sardinia. Our road was very rough, till we arrived at the vale of Chamouny; the great mountains and glaciers of Savoy rising majestically before us.

Another way leads from Trient to Chamouny over the *Col de Balme*. I passed it on a mule the 7th of September 1785; it is exceedingly steep, but not dangerous, as represented by many travellers; for I did not even find it necessary to dismount. The path, which is in no part bare rock, runs through a thick wood that clothes the sides of the mountain. We set off from Trient on this expedition about half past four, with the expectation of seeing the sun rise on the summit of Mont Blanc, but were disappointed; for we did not reach the Col de Balme in less than two hours, and day had already begun to break. We enjoyed, however, from the summit an extensive prospect, which many travellers consider as the most sublime view in all Switzerland: on one side it commands the Vallais, the alps of St. Bernard, and the

distant mountains of the cantons of Underwalden and Berne; the other comprehends Mont Blanc and the circumjacent heights. I observed the *Point de Mousson*; the *Mortine*, supporting on its top the glacier of *Buet*, on which M. de Luc made his celebrated experiments to ascertain the state of the atmosphere; the *Point de la Tour*; *Les Aiguilles d'Argentiere*; the *Aiguille de Midi*, a piked rock starting out of a large mass of snow; and, lastly, *Mont Blanc* itself. The highest point of this gigantic mountain is in the shape of a compressed hemisphere, and is called from its form *La Bosse du Dromadaire*; from that point it gradually sinks, presents a kind of concave surface of snow, in the midst of which is a small pyramid of ice; it then rises into a second hemisphere, called by some *Little Mont Blanc*, but with more propriety by others *Le Dome du Milieu*, or the *Middle Dome*; thence it descends into another concave surface terminating in a point, indiscriminately styled by the natives *Aiguille de Gouté*, *Point de Gouté*, and *Dome de Gouté*, and which I shall name the *Dome of Gouté*: from that dome it ends abruptly, and loses itself amid the mountains that bound the vale of Chamouny.

Mont Blanc is particularly distinguished from other mountains, by having its summit and sides clothed to a considerable depth with a mantle of snow, almost without the intervention of the least rock to break the glare of the *white* appearance; from whence its name is derived. This circumstance frequently deceives the eye unaccustomed to such objects, and in many situations renders it less lofty in appearance, than it is in reality. Although its summit was elevated more than seven

thousand feet above the spot where I stood, yet it did not impress me with that astonishment which might be expected from its superior height and magnitude above the circumjacent mountains. I was indeed more struck with the first view of the Schreckhorn from the top of the Scheidec, than of Mont Blanc from the Col de Balme. The summit of Mont Blanc being of a roundish form, and covered with snow, unites beauty with grandeur; whereas the Schreckhorn being piked, naked, and its shagged sides only streaked with snow, its grand characteristics are ruggedness and horror; and hence, indeed, it derives its name of Schreckhorn, or the *Peak of Terror*⁵. But Mont Blanc soon re-assumed its real importance, seemed to increase in size and height, and solely attracted our attention, until we entered the vale of Chamouny.

You, who are totally unacquainted with alpine scenes, may, perhaps, conceive a faint idea of the elevation of this gigantic mountain, on being informed, that the mantle of snow, which appears to cover its top and sides, exceeds an altitude of four thousand feet perpendicular, and nine thousand feet in a horizontal direction from the *Dome of Gouté* to the summit; and that the height of the snow and ice, estimated from the source of the Arveron, at the bottom of the glacier of Montanvert, to the summit of Mont Blanc, cannot be less than twelve thousand perpendicular feet,

⁵ The traveller will recollect, that I am here describing Mont Blanc, as observed from the Col de Balme, and the vale of Chamouny. Those who have seen it from the valley of Aost assure me, that it is not on that side covered with a mantle of snow, but exceeds even the Schreckhorn in ruggedness and horror.

or near three times as high as Snowdon, in North Wales.

Five glaciers extend into this vale of Chamouny; and are separated from each other by forests, corn-fields, and meadows; so that large tracts of ice are blended with cultivation, and perpetually succeed each other in the most singular and striking vicissitude. These glaciers, which lie chiefly in the hollows of the mountains, and are some leagues in length, unite at the foot of *Mont Blanc*; the highest mountain in Europe, and probably of the ancient world.

According to the calculations of Mr. De Luc, (by whose improvement of the barometer, elevations are taken with a degree of accuracy before unattainable), the height of this mountain above the level of the sea is $2,391\frac{1}{3}$ French toises, or 15,304 English feet⁶; or, according to Sir George Schuckborough, of 15,662 feet; which gives a difference of only 358 feet.

Mr. de Luc having found the altitude of the *Buet*, from thence took geometrically the elevation of *Mont Blanc*. The labors of this celebrated naturalist, and his rules for computing heights by the barometer, are to be found in his very valuable treatise, "*Sur les Modifications de l'Atmosphère*. These rules are explained, and his tables reduced to English measure, by Dr. Maskelyne, R. A.; and

⁶ In reducing the French toise, which is equal to six French feet, to English measure, I have considered the proportion of the English to the French foot as 15 to 16. Its real proportion, according to the accurate calculation of Sir George Schuckborough, is $\frac{12}{12784}$, or 15 to 16 and a small fraction: but the error in my calculation being not one toise in a thousand, in order to prevent confusion, I have omitted the small fraction.

still more fully by Dr. Horsley: both these treatises are published in the Philosophical Transactions for the year 1774.

The accuracy of the barometrical measurements made by Mr. de Luc, was verified by Sir George Schuckborough, in a number of ingenious experiments towards ascertaining the elevation of several mountains of Savoy, a short time before I arrived at Geneva. He followed Mr. de Luc's method; computed the heights of several mountains, reciprocally, by barometrical and geometrical observations; and perceived that the former coincided almost exactly with the latter. Having found the elevation of the summit of the *Mole* above the surface of the lake of Geneva, he took from thence the geometrical altitude of *Mont Blanc*. During the course of these experiments, he was enabled to correct some trifling errors that had crept into Mr. de Luc's calculations; to improve still further the discoveries of the latter; and has facilitated the means of taking elevations, by simplifying the tables and rules necessary for that purpose.

I am convinced, from the situation of *Mont Blanc*, and from its superior altitude above the surrounding mountains, that it exceeds the loftiest point in Switzerland, which, beyond a doubt, is, next to *Mont Blanc*, the most elevated ground in Europe. That it is higher than any part of Asia and Africa, is an assertion which can only be proved by comparing the judicious calculations of modern travellers, with the exaggerated accounts of former writers; and by showing, that there is probably no mountain in those two quarters of the globe, the altitude whereof, when accurately taken, surpasses 15,000 feet.

Perhaps in no instance has the imagination of man been more given to amplification, than in ascertaining the heights of the globe. Gruner, in his description of the Swiss glaciers, has mentioned the elevation of some remarkable mountains, agreeably to the calculations of several famous geographers and travellers, both ancient and modern:

	Toises. Eng. Feet.	
According to Strabo, the highest mountain of the ancient world was about	—	3,411 21,850
According to Riccioli	—	58,216 372,382
According to Father Kircher, who took the elevations of mountains by the uncertain method of measuring their shadows,	—	—
Aetna is	—	4,000 25,600
The Peak of Teneriff	—	10,000 64,000
Mount Athos	—	20,000 128,000
Larissa in Egypt	—	28,000 179,200

But these calculations are evidently so extravagant, that their exaggeration must strike the most common observer. If we consult more modern and rational accounts; it appears, that the Peak of Teneriff and Aetna have been frequently supposed to be the highest points of the globe. The former is estimated by some natural philosophers, to be 3,000 toises, or 19,200 feet above the level of the sea; but, according to Feuillé, this elevation is reduced to 2,070 toises, or 13,248 feet; whereas Aetna, by the accurate computations of Mr. de Saussure, rises only⁷ 1,672 toises, or 10,700⁴/₅

⁷ According to Sir George Schuckborough, 1,672 toises, or 10,954 feet: who says, "I have ventured to compute the height of this celebrated mountain from my own tables, though from an observation of Mr. de Saussure, in 1773,

feet above the sea. Hence it will appear, that there are no mountains, except those in America, the elevation whereof, according to Condamine, surpasses 3,000 toises, or 19,200 feet, which are equal to the altitude of Mont Blanc.

In order, however, to determine with absolute certainty that Mont Blanc is the highest point of the old world, it would be necessary to estimate, by the same mode of mensuration, Mont Blanc, the Schreckhorn, the Peak of Teneriff, the mountains of the Moon in Africa, the Taurus, and the Caucasus.

The chain of the Caucasus has long been deemed the highest mountains of Asia; and some philosophers, upon considering the great superiority of the eastern rivers over the European, both in depth and breadth, have drawn a presumptive argument, that the Asiatic mountains are much more lofty than those of Europe. But conjectures

“ which that gentleman obligingly communicated to me. It
 “ will serve to show that this volcano is by no means the highest
 “ mountain of the old world; and that Vesuvius, placed upon
 “ Mount Aetna, would not be equal to the height of Mont
 “ Blanc, which I take to be the most elevated point of Europe,
 “ Asia, and Africa.”

I am happy to find my conjectures corroborated by that ingenious and accurate observer.

	Feet.
Height of Aetna, according to Sir George	— 10,954
Of Vesuvius, according to Mr. de Saussure	— 3,900
Of both together	— 14,854
Height of Mont Blanc, according to Sir George	15,662
Difference, — or the height of Mont Blanc above	
that of Aetna and Vesuvius united	— 808

For still further information on this curious subject, the reader is referred to Mr. Trembley's *Analyse d'Expériences sur la Mesure des Hauteurs*, in Saussure's *Voyages dans les Alpes*, vol. ii. p. 616.

are now banished from natural philosophy: and, until it shall be proved from undoubted calculations, that the highest part of the Caucasus rises more than 15,000 feet above the level of the sea, Mont Blanc may be fairly considered as more elevated.

L E T T E R 37.

*Glacier of Bosson — Montanvert — Expedition
across the Valley of Ice.*

AUGUST 23d, we mounted by the side of the glacier of Bosson, to *les Murailles de glace*, so called from their resemblance to walls: they form large ranges of ice of prodigious thickness and solidity, rising abruptly from their base, and parallel to each other⁸. Some of these ranges appeared to us about a hundred and fifty feet high; but, if we may believe our guides, they are four hundred feet above their real base. Near them were pyramids and cones of ice of all forms and sizes, shooting to a very considerable height, in the most beautiful and fantastic shapes. From this glacier, which we crossed without much difficulty, we enjoyed a fine view of the vale of Chamouny.

The 24th. We had proposed sallying forth this morning very early, in order to visit the valley of ice, in the glacier of Montanvert, and to penetrate as far as the time would admit; but the weather proving cloudy, and likely to rain, we deferred our departure till nine. Having procured three

⁸ In 1785, these *murailles de glace* no longer existed.

guides, we ascended on horseback about three miles: we were then obliged to dismount, and scrambled up a steep and rugged path, called "the road of the *crystal-hunters*." From the summit of the Montanvert we descended to the edge of the glacier; and made a refreshing meal upon some cold provision which we brought with us. A large block of granite, called "*La pierre des Anglois*," served us for a table; and near us was a hovel⁹, where those, who make expeditions towards Mont Blanc, frequently pass the night. The scene around us was magnificent and sublime; numberless rocks rising boldly above the clouds, some of whose tops were bare, others covered with snow. Many of these peaks gradually diminishing towards their summits, end in sharp points, and are called *Needles*. Between these rocks, the valley of ice stretches several leagues in length, and is nearly a mile broad; extending on one side towards Mont Blanc, and, on the other, towards the plain of Chamouny.

The names of the principal needles are, Aiguilles de Midi, de Dru, de Bouchard, de Moine, de Tacul, de Charmeaux; and the five glaciers, that stretch towards the plain of Chamouny, and unite at the foot of Mont Blanc, are called Tacona, Bossons, Montanvert, Argentiere, and Tour.

After we had sufficiently refreshed ourselves, we prepared for our adventure across the ice. We had each of us a long pole spiked with iron; and, in order to secure us as much as possible from slipping, the guides fastened to our shoes *crampons*,

⁹ Since my first expedition, Mr. Blair, an English gentleman, has built a more commodious wooden hut, which, from him, is called Blair's Cabin.

or small bars of iron, provided with four small spikes of the same metal. The difficulty of crossing these valleys of ice, arises from the immense chasms. We rolled down large stones into several of them; and the great length of time before they reached the bottom, gave us some conception of their depth: our guides assured us, that in some places they are not less than five hundred feet deep. I can no otherwise convey to you an image of this body of ice, broken into irregular ridges and deep chasms, than by comparing it to waves instantaneously frozen in the midst of a violent storm.

We began our walk with great slowness and deliberation, but gradually gaining courage and confidence as we advanced, we soon found that we could safely pass along those places, where the ascent and descent were not very considerable, much faster even than when walking at the rate of our common pace: in other parts we leaped over the clefts, and slid down the steeper descents. In one place, where we descended and stepped across an opening upon a narrow ridge of ice scarcely three inches broad, we were obliged to tread with peculiar caution: for on each side were chasms of a great depth. We walked some paces sideways along this ridge; stepped across the chasm into a little hollow, which the guides contrived on purpose for our feet; and got up an ascent by means of small holes which we made with the spikes of our poles. This account appears terrible; but at the time we had not the least apprehensions of danger, as the guides were exceedingly careful, and took excellent precautions. One of our servants had the courage to follow us without *crampons*, and with no nails to his shoes; which was

certainly dangerous, on account of the slipperiness of the leather when wetted.

We had now almost reached the opposite side, when being stopped by a broad chasm, we were obliged to make a circuit of above a quarter of a mile, in order to get round it. This will give you some idea of the difficulty attending excursions over some of these glaciers: and our guides informed us, that when they hunt the chamois and the marmots, these unavoidable circuits generally carry them six or seven miles, when the direct distance is only two miles, if they could proceed in a strait line. A storm threatening every moment, we were obliged to hasten off the glacier as fast as possible: for rain renders the ice exceedingly slippery; and in case of a fog, which generally accompanies a storm in these upper regions, our situation would have been extremely dangerous. And indeed we had no time to lose; for we had scarcely quitted the ice before the tempest began, and soon became very violent, attended with frequent flashes of lightning, and loud peals of thunder, which being re-echoed within the hollows of the mountains, added greatly to the awful sublimity of the scene.

We now crawled for a considerable way upon our hands and feet along a steep and bare rock, and down one of the most difficult and rugged precipices I ever descended in Switzerland; the storm at the same time roaring over us, and rendering the rock extremely slippery. After much difficulty, but without the least accident, we gained the valley of Chamouny, and returned to the inn, as wet as if we had been plunged into water; but perfectly satisfied with our expedition.

P O S T S C R I P T.

In my second expedition to the valley of Chamouny, in 1785, instead of crossing the glacier, I ascended, in company with three Englishmen and a Swiss gentleman, from Blair's Cabin, about an hour and a half, over the bare and rugged rocks, to a summit under the *Aiguille des Charmoz*, near the spot from which a Genevan unfortunately fell and was dashed to pieces. On this summit, at the very edge of the fearful precipice which overlooks the vale of Chamouny, stood a collection of stones, about three feet high, called by the natives *le bon homme*. We immediately raised this heap to the height of six feet, and piled up another of the same elevation, which we styled, in the language of the country, *le monument de quatre Anglois*, in memory of the four¹ Englishmen who amused themselves in forming it.

I employed an hour in ascending part of the Montanvert on horseback; the same time in walking up to Blair's Cabin; an hour and a half to the *monument de quatre Anglois*; half an hour in descending to Blair's Cabin, and three quarters of an hour in passing from thence to Chamouny.

I made this expedition in company with M. Exchaquet, a Swiss gentleman, native of Aubonne, and director general of the mines of Savoy. His repeated expeditions into these regions have enabled him to execute a model in relief of the valley of Chamouny, Mont Blanc, the circumjacent alps, and glaciers. In order to render these

¹ Mr. Whitbread, the two Mr. Cliffords, and myself. We were accompanied and assisted by M. Exchaquet, a Swiss gentleman, remarkable for his numerous expeditions into these alps.

models still more valuable to the naturalist, he collects specimens of the different species of stones which compose the mountains represented on the plan. M. Exchaquet is now employed by the government of Berne, in constructing a model of the district of Aigle.

M. Exchaquet has discovered a more commodious route, than that hitherto followed, to ascend the Buet and Mount Breven, which are described by M. van Berchem, secretary to the Society of Sciences at Laufanne, in his letter² to Mr. Wyttenbach of Berne, relating an expedition to the mines of Faucigny, and the glaciers which extend at the foot of Mont Blanc. In these letters the reader will find, beside much accurate and picturesque description, an account of several fossil and vegetable productions of the higher alps.

LETTER 38.

Excursion towards the Summit of the Couvercle.

IN my subsequent expedition to the valley of Chamouny, I had proposed pushing my course still further towards the glacier of Talefre, but particularly to the Couvercle, of which I had read a very curious description in Mr. de Saussure's work. But having hurt my foot in my ascent to the Montanvert, I was prevented from executing my intended purpose. You will, however, have

² Excursion dans les Mines du Haut Faucigny, &c. Laufanne, 1787.

have no reason to regret my disappointment, on receiving the following account of that expedition, extracted from notes communicated by a friend.

We quitted the Priory at six in the morning, accompanied by Michael Paccard and Marie Coutet, two guides of Chamouny, traversed the plain, and ascended the Montanvert through a wood of pines. We had fine views of the glacier which gives rise to the Arveron, and of the vale of Chamouny, chequered in a most singular manner with alternate rows of arable and pasture land. After continuing about an hour, we quitted our mules, proceeded on foot, and in about an hour and a half reached Blair's Hut, on the top of the Montanvert, where we rested for a few minutes.

We then descended to the glacier, coasted it by the path of the crystal hunters, and in about half an hour came to some difficult passes called *Les Ponts*, or the Bridges, which run over a perpendicular rock, at the edge of a frightful precipice. These passages, though still difficult, were extremely dangerous, until, by order of M. de Saussure, the rock was in some parts blown away with gunpowder, and small holes formed for the hands and feet. The first bridge was about forty paces in length, and the two other passes somewhat less difficult, of about ten paces each. In about a quarter of an hour we arrived at a fountain which drops from the roof and sides of a natural grotto, the inside whereof is overgrown with large tufts of the *Ranunculus glacialis*. Having walked about eight miles since our departure from Chamouny, we sat down in this sequestered grotto, and made our first repast.

From hence we crossed some snow, the remains of a last winter's *Avalanche*, and immediately got upon the *Moraine*, the term given to the stones and earth which the glaciers disgorge on each side, after having received them from the superimposing mountains: they are very treacherous and difficult to walk upon. The ice upon which these stones rest is harder than that of the rest of the glacier; and the earth is laid in such regular and equable heaps, as to give the appearance of art. As we looked from hence over the valley of ice, it seemed impracticable; so numerous and broad were the chasms which intersected it in every direction, many bearing a tremendous appearance, and of an astonishing depth: but we soon found that it only required courage and activity. Instead of *crampons*, we had large nails in our shoes, which more effectually answered our purpose, and our spiked sticks were on this occasion particularly serviceable. Having descended upon the glacier, we found the ice softened by a warm wind, which rendered it less slippery than usual. We continued along it about a quarter of an hour, then regained and walked along the *Moraine* near half an hour. We now embarked upon the great valley of ice called *Glacier des Bois*, I own not without emotion to see ourselves upon this extraordinary desert, broken into frightful chasms, through the maze of which we were to pass. It was curious to observe the numerous little rills produced by the collection of drops occasioned by the thawing of the ice on the upper part of the glacier: these little rills hollow out small channels, and torrent-like precipitate themselves into the chasms with a violent noise;

increasing the body of waters formed by the melting of the interior surface, and finding an outlet under the immense arch of ice in the valley of Chamouny, from which the Arveron rushes. This ice-water was agreeable to the palate, and extremely refreshing from its coolness.

The field of ice, which at first sight seemed impervious to all but the chamois and marmot, and scarcely practicable even for the daring footsteps of man, is traversed by flocks of sheep, driven to the scanty pasturage which the opposite rocks afford. The shepherds leave them in these desolate spots, and visit them at different intervals. We traced their track over the ice, and saw a flock returning. One shepherd preceded as a guide, and another followed the herd. We had the good fortune to preserve one sheep which had strayed from the flock.

As we were continuing our course, we were surprised by a loud noise; and, looking round, perceived a large fragment of rock which had detached itself from one of the highest needles: it bounded from precipice to precipice with great rapidity, and, before it reached the bottom, was dissolved almost entirely into dust. Having proceeded about an hour, we were astonished with a view far more magnificent than imagination can conceive: hitherto the glaciers had scarcely answered my expectations, but now they far surpassed them. Nature had clad herself in all her terrors. Before us was a valley of ice twenty miles in extent, bounded by a circular glacier of pure unbroken snow, called Tacu, which leads directly to the foot of Mont Blanc, and is surrounded by large conical rocks, terminating in

sharp points like the towers of an ancient fortification; to the right rose a range of magnificent peaks, their intervals filled with glaciers; and far above the rest, the majestic summit of Mont Blanc, his highest points obscured with clouds. He appeared of such immense magnitude, that at his presence the circumjacent mountains, however gigantic, seemed to shrink before him, and “*hide their diminished heads* ³.” In half an hour we arrived at the Moraine, which forms a boundary of the valley, crossed it, and proceeded upon a body of ice about three quarters of a mile broad. Here the ice was more even and free from chasms than in the great valley. We then passed a second Moraine, and beyond that another mass of ice to a third Moraine: descending from thence, we came upon the last ridge of ice, broader considerably than the two former, and full of large chasms: it is separated from the rock only by a very narrow Moraine. These Moraines contain great quantities of crystal.

Here we turned a little to the right, and ascended the valley of ice, the scene every moment increasing in magnificence and horror. In a short time we arrived at the foot of the Couvercle, having walked about six miles on the ice. We now found it difficult to quit the ice; and the first part of the descent was really perilous. One step was truly dreadful: a bulging rock entirely smooth, and presenting a precipice of very considerable depth, which was terminated by an immense chasm in the ice, seemed to forbid our progress; a small hollow, however, in the middle

³ Milton.

served for one foot, and from thence we bounded over to the firm ground. One guide went first, and held out his hand on the opposite side, whilst the other helped and directed us where to place our feet. We continued ascending a path which now seemed without danger, though very narrow and steep, and carried along the ridge of precipices. The scenery around was indeed so sublime as to banish all ideas of fatigue and apprehension. Half an hour more brought us to the side of a fountain, where we sat down to our dinner. We had now employed five hours and a half from Chamouny, and notwithstanding all difficulties and necessary halts, had walked fifteen miles, but none of us complained of fatigue.

The clouds beginning to gather, warned us to hasten to the top of the Couvercle. From that station we had the view of three stupendous valleys of ice, the glacier of Talefre to the left, in front that of l'Echaut, and the Tacu to the right, all uniting in one great valley of ice called the *Glacier de Bois*, which stretched under our feet, and was surrounded and ornamented by the rugged needles.

The dead silence, which reigned in this place, was only interrupted by the bounding of distant chamois, and the cries of alarm which the marmots gave to their tribes at our approach.

Having refreshed ourselves, we proceeded to the top of the Couvercle, a most extraordinary rock, having the appearance of a large irregular multilateral building placed on a mountain. The rock is granite, the ascent was laborious, but perfectly secure. Towards its foot we found a bottle containing the names of two Englishmen

who had reached that place about a fortnight before, and probably flattered themselves that no stranger would go beyond them. We wrote our names on the reverse of the paper, and carried the bottle with us to the summit of the Couvercle. Three quarters of an hour brought us to the point, and we reached a rock overhanging a precipice which my eyes dared not measure. In this situation we were surprised with a thunder storm, which added great horror and magnificence to the scene. We took shelter under an impending rock, and listened to the roaring of the storm with a mixed sensation of fear and pleasure. On reflecting in this place that we were to measure back the same ground, and to undergo a repetition of the same difficulties, we were not exempted from alarm: but recollecting, that it is the duty of man to encounter some dangers, in order to behold such glorious scenes, we from that moment banished all apprehensions.

Our view from the top of the Couvercle comprehended the same sublime scenes we had enjoyed from its base, but considerably heightened and enlarged; and the stupendous extent of ice appeared like a rugged expanse of frozen sea, bounded by the most gigantic rocks, and terminated by Mont Blanc, the Atlas of the globe.

Although we were thus entirely enclosed between ice and snow, and barren crags, where all vegetation might be supposed to cease; yet our eyes reposed on a triangular rock, clothed with grass and alpine plants, and starting up like a fertile island in the midst of a desolate ocean. It is known by the name of the *Garden*, and exhibits a curious contrast to the surrounding dreariness.

During our expeditions into the Alps, we had frequently found occasion to remark the peculiarly deep shade of the blue color in the “*pure Empyrean*”⁴; and to-day we were more particularly affected with this circumstance. It conveyed a most sublime idea of the infinity of space: the higher we ascended, the more beautiful it seemed; and we were informed by a person accustomed to alpine scenes, that on considerable elevations he had frequently observed the stars at noon-day.

Our descent from these icy regions was no less fortunate than our ascent; we reached the Priory at seven in the afternoon, without the least accident, and wrapt in astonishment on the recollection of scenes, which surpass the imagination, as much as they defy description.

I am, &c.

L E T T E R 39.

Various attempts to reach the summit of Mont Blanc — Successful Expedition of James Balma and Dr. Paccard — Of Monsieur de Saussure — His physical Observations.

VARIOUS attempts having been made to reach the summit of Mont Blanc, as well by the guides of Chamouny, as by Messieurs de Saussure and Bourrit; a chronological account of the principal expeditions, which have at length terminated successfully, will not, perhaps, be uninteresting.

⁴ Milton.

The first enterprize was formed by Mr. Couteran and three guides of Chamouny, Michael Paccard, Victor Tiffay, and Marie Coutet. On the thirteenth of July 1776, these adventurers set off from the Priory about eleven in the evening. They passed between the glaciers of Bosson and Tacona; and after having employed above fourteen hours in mounting rugged and dangerous ascents, in crossing several vallies of ice, and large plains of snow, they found themselves upon the top next to Mont Blanc. At first sight, it appeared scarcely a league distant; but they soon discovered that the clearness of the air, the extraordinary whiteness of the snow, and its great height, made it seem nearer than it was in reality: and they perceived with regret, that it would require at least four hours more to reach the summit, even supposing it practicable. But as the day was far advanced, and the vapors towards the summit of Mont Blanc began to gather into clouds, they were obliged to relinquish their enterprize. As they were returning in great haste, one of the party slipped in attempting to leap over a chasm of ice. He held in his hand a long pole, spiked with iron, which he had struck into the ice; and upon this he hung dreadfully suspended for a few moments, until he was released by his companions. The danger he had just escaped, made such an impression upon him, that he fainted away, and continued for some time in that situation: he was at length brought to himself, and, though considerably bruised, sufficiently recovered to be able to continue his journey. They arrived at Chamouny about eight that evening, after having employed two-and-twenty hours: as some sort of

recompence for so much fatigue, they enjoyed the satisfaction, at least, of having approached nearer to Mont Blanc than any former adventurers.

According to Sir George Schuckborough, the summit to which they arrived is more than 13,000 feet above the Mediterranean. These persons, however, did not take the necessary precautions for so perilous an enterprise: for the expedition was not only extremely hazardous, but was also far too fatiguing and difficult to be accomplished within twenty-four hours. They ought to have set out in the morning, and to have found some proper place in which they might pass the night; they would then have been sufficiently refreshed the next morning to pursue their expedition; and would not have found themselves, after advancing within four hours of Mont Blanc, unable to proceed, and in danger of being overtaken by darkness in so dreary a situation. The failure of this expedition seemed for some time to repress all future attempts to attain the top of Mont Blanc, until the indefatigable Mr. Bourrit infused a new spirit into the inhabitants of Chamouny. After reiterated though unsuccessful attempts, on the 11th of September 1784, Mr. Bourrit, accompanied by six guides, departed from Bionasay; and was *scaling*, as he expresses himself, the *rampart* of Mont Blanc, when he suddenly found himself so extremely affected by the intense cold, that he was unable to proceed.

Marie Coutet and Francis Guidet, two of the guides who attended him in this expedition, had preceded their company, and ascended to the Dome of Gouté, which is about 9,400 feet in a strait horizontal direction from the summit. Marie

Coutet informed me, that they passed the Middle Dome, and walked along the ridge between that dome and the summit as far as some high rocks, which appear from the vale of Chamouny like small points rising out of the snow; but night approaching, obliged them to return.

On the 4th of September 1785, Marie Coutet and James Lambat reached a place under a rock at a considerable elevation, where they passed the night. Setting off before sun-rise, found themselves about seven on the Dome of Gouté; and were proceeding towards the summit, with a fair prospect of success, when a violent storm of hail ensued, accompanied with such a strong wind, as compelled them to return.

On the 13th of September, Messieurs de Saussure and Bourrit, attended by twelve guides well provided with barometers, thermometers, and other instruments, for the purpose of making the necessary observations, departed from Bionafay, and arrived at a hut, which they had ordered to be constructed at *Pierre Ronde* 7,808 feet above the level of the sea. Here they passed the night, and early the next morning reached the Dome of Gouté without the least accident, and without much difficulty; where they were stopped by a fresh fall of snow, into which they sunk so deep, that all farther progress was impracticable.

Mr. de Saussure informs us, that the mercury in the barometer sunk eighteen inches and a half, and that he reached an elevation of 1,290 toises, or 8,256 English feet.

At length, in July 1786, six guides of Chamouny having failed in another attempt, James Balma, one of the company, being overtaken by darkness,

as he was rambling upon the ice, missed his way, and passed the night in a spot above the Dome of Gouté, elevated more than 12,000 feet above the level of the sea. His youth, and the strength of his constitution, having preserved him from the effects of the nocturnal cold in so severe an atmosphere, at the approach of morn he reconnoitred the situation, and observed a part which appeared to him more easy of access than any of the others that had been hitherto attempted.

On his arrival at Chamouny he was seized with a very severe indisposition, the effect of extreme fatigue, and of the intense cold. Being attended by doctor Paccard, a physician of the place, James Balma communicated his observations; and, in gratitude for his attendance, offered to conduct him to the summit of Mont Blanc.

On the 7th of August, these two daring adventurers sallied from Chamouny upon this memorable expedition, and reached before dark the mountain of *La Cote*, which overhangs the upper part of the glacier of Bosson. Here they passed the night; and at three in the morning pursued their route over the ice, ascended the Dome of Gouté, passed under the Middle Dome, and at the last pyramid of rock turned to the east, and continued along the ridge, which is seen from Geneva, and lies on the left of the summit. Here they first began to experience such intense cold, and such extreme fatigue, that Dr. Paccard was almost induced to relinquish the enterprize: being, however, encouraged by James Balma, more accustomed to such fatiguing and dangerous expeditions, he followed his companion. The wind was so violent and piercing,

that in order to avoid its blowing in their faces, they were obliged to walk sideways for a considerable time. About six in the afternoon, they at length attained the summit of Mont Blanc; and stood triumphantly on a spot of ground, which no one had reached before, and at the elevation of 15,662 feet above the sea, which is undoubtedly the highest point in the ancient globe. They remained on the summit no more than half an hour, the cold being so intense, that the provision was frozen in their pockets, the ink congealed in their inkhorns; and the mercury in Fahrenheit's thermometer sunk to $18\frac{1}{2}$ degrees. Doctor Paccard had just time to observe the state of the barometer, which he has not communicated to the public.

They had employed fifteen hours in ascending; and though they again reached the mountain of La Cote in five hours, yet they found great difficulty in descending, their sight being debilitated by the reflection from the snow. They arrived at La Cote about midnight, after twenty hours unremitted fatigue. Having reposed themselves two hours, they again sallied forth, and returned to Chamouny at eight in the morning. Their faces were excoriated, and their lips exceedingly swelled; Dr. Paccard was almost blind, and his eyes continued to be affected for a considerable time.

We cannot expect any accurate experiments from these two persons, to whom the glory of having first ascended the summit of Mont Blanc is undoubtedly due. But they prepared the way for the observations and discoveries of future naturalists, and particularly of M. de Saussure, whose indefatigable zeal did not permit him to

rest, until he had reached the top of Mont Blanc, and made those experiments which cannot fail greatly to elucidate the theory of the atmosphere.

That able naturalist set out on this successful expedition, from the valley of Chamouny, on the 13th of August 1787. He was accompanied by eighteen guides, who carried a tent, matresses, all necessary accommodations, and instruments of experimental philosophy. They passed the first night on the top of the mountain of La Cote, in a hut previously constructed for that purpose. At four o'clock in the following afternoon they reached an elevation of 9,312 feet above the Priory, or 12,762 above the level of the sea. Here they encamped, and formed an excavation in the congealed snow, which they covered with a tent. In this icy habitation, instead of suffering from the cold, M. de Saussure felt such a suffocating heat, from the closeness of the tent, and the number of persons crowded in so small a compass, that he was frequently obliged to go into the open air in order to breathe.

The next morning the whole company departed at seven; and found the ascent in some places so steep, that the guides who preceded were obliged to hew out steps with a hatchet. At eleven they reached the summit of Mont Blanc. Here they continued three hours and a half, during which time M. de Saussure enjoyed, with rapture and astonishment, a view the most extensive as well as the most rugged and sublime in nature; and made those observations which will render this expedition no longer a matter of mere curiosity. Until a complete and ample detail of those observations shall be communicated to the public,

you will perhaps not be displeased with the following particulars selected from a temporary publication of M. de Saussure himself^s.

He did not find the cold so extremely piercing as was experienced by Dr. Paccard and James Balma. By comparing his experiments on Mont Blanc with those made at the same time by M. Senebier at Geneva, he was enabled to make the following observations. Reaumur's thermometer stood in the shade at $2\frac{3}{10}$ below freezing point, or 27. of Fahrenheit; at Geneva at 22. 6, or 82 of Fahrenheit, which gives a difference of near 25 degrees of Reaumur, or 45 of Fahrenheit, between the state of the atmosphere at both places.

De Luc's barometer fell to $16.0\frac{144}{160}$, and as it stood at Geneva at $27.2\frac{1085}{1600}$, it gives a difference of 11. 2, without regarding the fraction. On estimating the height of Mont Blanc from barometrical experiments, he found it almost exactly correspond with that given by Sir George Schuckborough, or 15,662 English feet above the level of the sea, and which reflects the highest honor on the accuracy of the English observer.

By experiments with the hygrometer, the air on the top of Mont Blanc contained six times less humidity than that of Geneva; and to this extreme dryness of the atmosphere, he imputes the burning thirst which he and his companions experienced. It requires half an hour to boil water on the top of Mont Blanc, fifteen or sixteen minutes are sufficient at Geneva, and fourteen or

^s A translation of this account, by the Rev. Mr. Martyn, professor of botany in the university of Cambridge, printed by Kearsley, forms an Appendix to his Sketch of a Tour through Switzerland, which I would recommend to the traveller.

fifteen by the sea side. By experiments on the electrometer, the balls diverged only three lines; the electricity was positive. On the summit he noticed two butterflies on the wing; observed, at the elevation of 11,392 feet above the sea, the *Silene Acaulis*, or moss campion, in flower; and still higher up, on the most elevated rocks, the *Lichen Sulphureus* and *Lichen Rupestris* of Hoffman.

He adds, that the summits of Mont Blanc and the adjacent mountains are composed of granite, and that, next to Mont Blanc, the Schreckhorn and Mount Rosa in Piedmont, appeared the most elevated points.

M. de Saussure, as well as many of his party, found themselves extremely affected by the rarefaction of the air; and at two began returning. They descended a little lower than the place in which they passed the preceding night, arrived the next morning at the valley of Chamouny without the least accident, and, as they had taken the precaution to cover their faces with crape, their skins were not excoriated, nor their sight debilitated.

On the eighth of August, a few days after M. de Saussure's expedition, Mr. Beaufoy, an English gentleman, succeeded in a similar attempt, though it was attended with greater difficulty, arising from the enlargement of the chasms in the ice. An account of this expedition was read before the Royal Society on the 13th of December 1787, and will probably be communicated to the public.

LETTER 40.

*Conjectures on the Formation and State of the
Glaciers.*

NO subject in natural history is more curious than the origin of these glaciers, extending into fields of corn and pasture, and lying, without being melted, in a situation, where the sun is sufficient to bring the earth to maturity: for it is almost literally true, that with one hand I could touch ice, and the other ripe corn. As in my first expedition to the alps my stay was exceedingly short, I declined entering upon a subject too important to be superficially treated, and only threw together a few hasty remarks, which occurred to me on the spot. But I find that these remarks, however hasty and superficial, served to excite your curiosity; and have induced you to inquire, "*Which is the most rational system concerning the formation of the glaciers? Are they in a state of augmentation or diminution; or do they remain within the same limits?*"

Although in my subsequent journeys to the alps I made this subject a particular object of research; and although I have attentively perused the principal systems, which have been formed concerning the formation of glaciers; yet it is not without great diffidence, that I can presume to reply to your very arduous questions.

The theory of Gruner, confirmed and amended by that able naturalist M. de Saussure, appears to me the most simple and rational; and I do not know how I can better satisfy your curiosity, than by forming an extract from his much esteemed
work

work ⁶, interspersing it with a few additional remarks drawn from my own particular observations.

If a person could be conveyed to such an elevation as to embrace at one view the alps of Switzerland, Savoy, and Dauphiné, he would behold a vast chain of mountains, intersected by numerous vallies, and composed of many parallel chains, the highest occupying the centre, and the others gradually diminishing in proportion to their distance from that centre.

The most elevated, or central chain, would appear bristled with pointed rocks, and covered, even in summer, with ice and snow, in all parts that are not absolutely perpendicular. On each side of this chain he would discover deep vallies clothed with verdure, peopled with numerous villages, and watered by many rivers. In considering these objects with greater attention, he would remark, that the central chain is composed of elevated peaks and diverging ridges, whose summits are overspread with snow; that the declivities of the peaks and ridges, excepting those parts that are extremely steep, are covered with snow and ice; and that the intermediate depths and spaces between them are filled with immense fields of ice, terminating in those cultivated vallies which border the great chain.

The branches most contiguous to the central chain would present the same phenomena, only in a lesser degree. At greater distances no ice would be observed, and scarcely any snow, but upon some of the most elevated summits; and the mountains diminishing in height and ruggedness,

⁶ Voyages des Alps, v. 2. c. 7.

would appear covered with herbage, and gradually sink into hills and plains.

In this general survey, the glaciers may be divided into two sorts; the first occupying the deep vallies situated in the bosom of the alps, and termed by the natives *Vallées de Glace*, but which I shall distinguish by the name of *Lower Glaciers*; the second, which clothe the summits and sides of the mountains, I shall call *Upper Glaciers*.

1. The Lower Glaciers are by far the most considerable in extent and depth. Some stretch several leagues in length; that of des Bois in particular is more than fifteen miles long, and above three in its greatest breadth.

The Lower Glaciers do not, as is generally imagined, communicate with each other; and but few of them are parallel to the central chain: they mostly stretch in a transverse direction, are bordered at the higher extremity by inaccessible rocks, and on the other extend into the cultivated vallies.

The thickness of the ice varies in different parts. M. de Saussure found its general depth in the glaciers des Bois from eighty to a hundred feet; but questions not the information of those who assert, that in some places its thickness exceeds even six hundred feet.

These immense fields of ice usually rest on an inclined plain: being pushed forwards by the pressure of their own weight, and but weakly supported by the rugged rocks beneath, are intersected by large transverse chasms; and present the appearance of walls, pyramids, and other fantastic shapes, observed at all heights and in all situations, wherever the declivity exceeds thirty or forty degrees.



But in those parts, where the plain on which they rest is horizontal, or only gently inclined, the surface of the ice is nearly uniform; the chasms are but few and narrow, and the traveller crosses on foot, without much difficulty.

The surface of the ice is not so slippery as that of frozen ponds or rivers: it is rough and granulated, and is only dangerous to the passenger in steep descents. It is not transparent, is extremely porous and full of small bubbles, which seldom exceed the size of a pea, and consequently is not so compact as common ice: its perfect resemblance to the congelation of snow impregnated with water, in its opacity, roughness, and in the number and smallness of the air-bubbles, led M. de Saussure to conceive the following simple and natural theory on the formation of the glaciers.

An immense quantity of snow is continually accumulating in the elevated vallies which are enclosed within the alps, as well from that which falls from the clouds during nine months in the year, as from the masses which are incessantly rolling from the steep sides of the circumjacent mountains. Part of this snow, which is not dissolved during summer, impregnated with rain and snow-water, is frozen during winter, and forms that opaque and porous ice of which the Lower Glaciers are composed.

2. The Upper Glaciers may be subdivided into those which cover the summits, and those which extend along the sides of the alps.

Those which cover the summits of the alps owe their origin to the snow that falls at all seasons of the year, and which remains nearly in its original state, being congealed into a hard

substance, and not converted into ice. For although, according to the opinion of some philosophers, the summit of Mont Blanc, and of other elevated mountains, is, from the glistening of the surface, supposed to be covered with pure ice; yet it appears, both from theory and experience, that it is not ice but snow. For, in so elevated and cold a region, there cannot be melted a quantity of snow sufficient to impregnate with water the whole mass, which remains undissolved. Experience also justifies this reasoning. M. de Saussure found the top of Mont Blanc only incruusted with ice, which, though of a firm consistence, was yet penetrable with a stick; and on the declivities of the summit he discovered, beneath the surface, a soft snow without coherence.

The substance which clothes the sides of the alps is neither pure snow like that of the summits, nor ice which forms the Lower Glaciers, but is an assemblage of both. It contains less snow than the summits, because the summer heat has more power to dissolve it, and because the liquefied snow descending from above, the mass is penetrated with a larger quantity of water. It contains more snow than the Lower Glaciers, because the dissolution of the snow is comparatively lesser. Hence the ice is even more porous, opaque, and less compact than the ice of the Lower Glaciers; and is of so doubtful a texture as renders it, in many parts, difficult to decide, whether it may be called ice or frozen snow.

In a word, there is a regular gradation from the snow on the summits to the ice of the Lower Glaciers, formed by the intermediate mixture of snow and ice, which becomes more compact and

less porous in proportion as it approaches the Lower Glaciers, until it unites and assimilates with them. And it is evident, that the greater or lesser degree of density is derived from the greater or lesser quantity of water, with which the mass is impregnated.

In regard to your second question, "*Whether the glaciers are in a state of increase or diminution*," though I declined on a former occasion to enter minutely upon a subject, which required much accurate observation and repeated experimental investigation; yet I ventured to make one remark, which seemed to prove the occasional increase and diminution of the glaciers; contrary to the opinion of some philosophers, who maintain, that they continue always the same, and of others, who assert, that they are continually increasing ⁷.

The borders of the glacier of Montanvert, are mostly skirted with trees: towards its base a vast arch of ice rises to near a hundred feet in height; under which the Arveron rushes with considerable force, and in a large body of water. As we

⁷ Mr. Core generalizes here a fact which is absolutely particular, and applies to the whole mass of the glaciers the result of an observation made but on some of their branches. He seems to lose sight of the question; and to grant but a superficial knowledge to such as think the augmentation of the ice possible, when he supposes that, by maintaining the total increase, they pretend to warrant that of each particular ramification. They are sensible that nature is not so regular in her operations, and that without ceasing one moment to follow her original plan, she may abandon its different parts to the caprice of circumstances. — In my observations, at the end of this letter, I shall cast a look on the variations of the inferior glaciers, and endeavour to prove that they proceed more from their situation than from any cause acting at the same time on the whole mass of ice. RAMOND.

approached the ice, we passed through a wood of firs: those trees which stand at a little distance from the arch are about eighty feet high, and are undoubtedly of a very great age. Between these and the glacier, the trees are of a later growth; as is evident from their texture and inferior size. Others, still smaller, have been overturned and enveloped in the ice: there seems to be a kind of regular gradation in the age of these several trees, from the largest which are standing to the smallest that lie prostrate.

These facts justly lead to the following conclusions:—that the glacier once extended as far as the row of tall firs; that, upon its gradual dissolution, a number of trees shot up in the very spots which it formerly occupied; that, since that period, the ice has again advanced; and has overturned the trees of later date, before they had grown to any considerable height.

To these circumstances, the following fact may be added. Large stones of granite are usually found at a small distance from the extremities of the glacier. These stones have certainly fallen from the mountains upon the ice, have been carried on in its progress, and have tumbled into the plain upon the dissolution or sinking of the ice which supported them. These stones, which the inhabitants call *Moraine*, form a kind of border towards the foot of the valley of ice, and have been pushed forward by the glacier in its advances: they extend even to the place occupied by the larger pines.

As several writers upon Switzerland have, in contradiction to these facts, endeavoured to prove, that the snow and ice are continually accumulating

in the alps, I shall here throw together a few additional remarks, that may tend to confirm the contrary opinion.

The Inferior Glacier of Grindelwald was so considerably diminished since my first expedition in 1776, that the spot which its extremity then occupied was, in 1785, removed at least four hundred paces from its former site. In the valley of Chamouny, the *Murailles de Glace*, which I described as forming the border of the glacier of Bosson, no longer existed; and young trees had shot up in the parts which were then covered by the glacier of Montanvert.

The advocates, however, for the increase of the glaciers, admitting these facts, yet deny that any judgment can be formed concerning the state of the more elevated regions, from what passes in the vallies, where the sun has power to bring the fruits of the earth to maturity. They assert that it appears, both from theory and fact, that more snow falls, and more ice is annually formed in the alps than can be annually dissolved.

To judge from theory; they argue, that the cold occasioned by the mass of ice already formed ought to augment it still further; and in regard to experience, it is evident, that within the memory of the present generation, many mountains have been covered, many pastures and habitations invaded, and many passages irrecoverably obstructed by the ice.

In considering the arguments drawn from theory; we may observe, that the causes which tend to the diminution of the ice, are no less powerful than the augmentation of the cold, which is supposed to occasion its indefinite

increase. These causes are principally; 1. rain and fleet in the less elevated regions; 2. evaporation; 3. descent of the snow and ice, both precipitous and gradual; 4. heat of the atmosphere; 5. mean temperature of the earth.

1. The rain and fleet, which falls during summer upon the Lower Glaciers, not only thaws the ice, but increases those rills that collect on the surface, excavate channels, descend into the clefts, and assist in forming them.

2. Evaporation is a still more powerful cause; as it acts at all heights, and in all seasons.

3. The descent of the snow and ice, as distinguished by precipitous and gradual. The precipitous, or continual fallings of congealed snow, termed by the natives *avalanches*, are detached either by their own weight, softened from their hold by the heat of the sun or the warm air which blows from the south, or overthrown by the violent hurricanes that are extremely common in the upper alps. When these masses are precipitated into a milder air, though they may sometimes indeed resist the influence of heat, and form valleys of ice, yet they are more usually dissolved. These *avalanches* are most common in the Upper Glaciers; whereas the gradual descent of the ice is chiefly confined to the Lower Glaciers, and is a very powerful agent in lessening the aggregate mass.

All the Lower Glaciers, or vallies of ice, rest on an inclined plain, are arched or hollow, and are undermined and weakened by the torrents, which are constantly flowing, as well from the Upper Glaciers, as from their own interior surface. The natural tendency of a heavy body in such a position is to descend; and its progressive motion

is accelerated in proportion to its own weight, and the greater inclination of its basis. This progressive motion, which acts, though imperceptibly, yet gradually and uniformly, carries the ice into those cultivated plains and vallies, where the sun ripens the fruits of the field; and where a period is necessarily put to its farther increase.

If you require a proof of this imperceptible descent, the answer is obvious. It is to be collected from the facts which I have already enumerated; namely, from the trees which are occasionally overturned by the ice in its progress, and by the moraine of stones which is observed at the bottom of the Lower Glaciers. These stones being similar to the mountains of the upper alps, and essentially different from the rocks below, must have been conveyed by the ice in its descent from the Upper Glaciers.

4. The heat of the atmosphere, or the efficacy of the sun's rays on the outward surface of the glaciers, is too evident to require any proof, even to those who have never been in the alps.

Another cause of a thaw, derived from the heat of the atmosphere, which will not be expected by those who have not visited these icy regions, is the warm winds which blow by night as well as by day in the Upper no less than in the Lower Glaciers. These warm winds are, during summer, so common in these parts, that I never crossed a glacier without feeling, in some particular positions, a warmth similar to the air of a hot-bath.

5. But as these two causes only operate in summer; and as the sun's rays do not produce sufficient effect in the highest parts, we must have recourse to the mean temperature of the earth,

which seems to be the greatest and most powerful agent in preventing an indefinite augmentation of ice and snow. This mean temperature, termed by some philosophers the internal⁸ heat of the earth, is always above the freezing point, as is evident from the heat of the springs which issue from the bowels of the earth. In winter, therefore, or in those high regions of the globe where the cold is usually below the freezing point, when any spot of ground is covered with only a thin coat of snow, it may be so far cooled, to a certain depth, by the influence of the external air, as not to be capable of dissolving any part of the superincumbent snow. But when the mass of snow is of such a thickness as to protect the surface of the ground from the effects of the atmospherical cold, the mean temperature, which is always above the freezing point, will be sufficient to melt the contiguous surface of snow, and to occasion a constant thaw, which supplies those currents of water, that flow, at all seasons, from the Upper and Lower Glaciers.

In regard to the argument derived from experience, it is sufficient to observe, that while I admit the facts which prove the progress of the ice, it by no means seems to follow that its sum is perpetually increasing. For the advocates who support this opinion, while they scrupulously

⁸ Some philosophers impute this constant thaw, which takes place in the lower surface of the glaciers, to an internal source of heat in the earth; but that opinion has been very ably refuted by several modern naturalists; the mean temperature of the ground being found sufficient to account for *all* the phenomena, local circumstances excepted, which have been usually assigned to an internal heat of the earth,

enumerate the places which have been invaded by the ice, do not take any notice of those parts, no less numerous, from which the ice has retired.

During my second expedition into the Alps, I also made this point of controversy a particular object of my researches; and on inquiring from the *chasseurs*, and other persons who frequent the mountains, the greatest part were of opinion that the collection of ice and snow, even in the elevated regions, was by no means in a continual state of augmentation; but that while it gained in some places it diminished in others; and that upon an average, the aggregate mass was nearly the same.

*The French Translator's Observations on the
Glacieres and the Glaciers*.*

Twenty centuries elapsed, since Rome, casting for the first time her eyes on those unexplored regions, whence the barbarians whom she most dreaded, emerged, beheld with terror a ridge of mountains higher than the Alps, covered at all seasons with snow. The civilized world believed for some time that Italy bordered by the Alps on the frozen pole of the North †.

Whilst the Romans viewed these mountains with wonder, Hannibal traversed over them. He was the first who thought that the snows could not cover this whole surface; he saw the fierce and free inhabitants, and crossing those unknown pasturages, defended by so many towering ramparts, taught the Romans that they were not invincible.

The places where the Carthaginians passed are not precisely ascertained, because we know not to which part of

* *Glacieres* are extensive fields of ice, and *Glaciers* particular branches or ramifications of them.

† See Polybius, book II.

these mountains we are to apply the description of the historians who have recorded this surprising expedition. What may be inferred from their narration is, that the Alps had then attained old age; their vallies were sunk into abysses, and their gentle declivities were changed into steepy precipices; the crumbling rocks betrayed their decrepitness; and the fields of ice which Hannibal met were, no doubt, the first encroachments of the superior glaciers. This is all we read in history; but in which annals are we to look for the youth of these elder daughters of the earth. How far up must we remount to find the infancy of what has been old for so long a time? When a weak machine, the work of a moment, which moves, feels, and suffers, which lives, that is, tends by its proper force towards its dissolution; when man reckons by years; by what periods must these rude, inert masses, formed like the globe of which they make part, to resist the destruction which is ceaselessly changing its surface, compute the age of their existence?

Let us then not regret the loss of the facts which escaped to the observation of the historian. For, what are comparisons between centuries? There exists another history, in which that of nations holds but an imperceptible space; I mean the history of nature. The man of genius who studies it, overleaps at once the times cleared up by our historians; and leaving behind him the nations and their remotest motions, penetrates into the darkest antiquity, fixes its epochas, and points out its revolutions. Setting out from the banks of the sea, where he collects the latest facts, and marks the *yesterday* of nature; because, in comparison to her, nations are but the beings of a day: Soon he reaches the neighbouring hills, newly formed by the withdrawing of the waters from the continent. These are long parallel ridges, not very high, produced by the gradual retreat of the ocean, tending with less impetuosity towards the basin which it occupies. Farther off mountains arise, extending every where, and announcing by their different directions the struggles of the waters. Here the currents are

marked by broad and deep vallies, whose heights and precipices had been formerly overflowed by a raging sea; the presence of the waters is proved by large banks of shells and other marine productions; and the petrefactions attest the number of centuries elapsed since they left them. Higher up the forms are grander; witnessing convulsions more violent, means more powerful, and an antiquity more remote. Each degree of elevation adds a century to the age of the mountains; and the observer, having gained a height of a thousand yards above the level of the sea, is at the greatest height where one finds traces of the stay of the waters, and marks the remotest epocha of their known labors. He is however far from having attained the highest points which bristle the globe. Even from the bosom of the mountains which he has ascended, a frightful chain of simple rocks, which seem to have for ever commanded a shoreless ocean that tumbled its waters round the globe, rear their heads. In vain would he look for degrees and epochas between them and the heaps formed by the waters. Here there is a blank in the annals of nature. The production of these mountains so unlike in their composition must proceed from different causes. That of the latter is evident from the presence of the spoils of the animal and vegetable world which compose the secondary mountains, proving that nature was then animated; but what being was present at the birth of the primitive mountains? or do they consist of any thing else but the most simple aggregates of fossils? When our planet brought them forth it was but an arid solitude.

Such is the antiquity of these mountains; almost coeval with the globe, they offer as wide a field for conjecture. If we believe the possibility of a general conflagration of the earth, which kept it for a long time in a state of fusion, we see them arise from the unequal approximation of its parts, and the protuberances occasioned by its first cooling*. If,

* System of Mr. De Buffon.

on the contrary, we suppose that the water, could remain for a long time at a height double of that which is commonly assigned to it, we might think that, destitute of inhabitants, and rolling nothing but a mineral mud, they formed that enormous heap of simple rocks*. But we have nothing to do with these fanciful systems. The existence of the primitive mountains interests us only from that moment, when rearing from the bosom of the waters, invested with that covering of secondary mountains, which rendering their forms smooth, blunts their edges and serves to vegetation, they are linked together and stretch on all sides over the continent, in order to divide its uniform extent into regions, and to destroy that flatness which would expose it to repeated inundations, and doom it to everlasting aridity. In these primitive chains every thing is regular, and bears the stamp of the first designs of nature. Their gentle and luxuriant declivity exhibits, without confusion, all the gradations of vegetation, answering exactly to the different regions of the atmosphere, and passing insensibly from the profuse fertility of the plains to the niggard scantiness of the heights. The moss terminates the vegetable kingdom; above it all is a barren waste. Thus does the chain of original rocks, towering proudly over the habitable world, as they did formerly over the waters which deluged the earth, seem to elude once more the general law of nature; but it is only to be subservient to her commands in another manner. The barren tops of this chain of mountains are condemned to bear eternally an immense load of snow; and whilst their bases,

* This is the opinion of Mr. de Saussure, expressed in his excellent work on the Alps. He is the first who fancied to have discovered in the primitive mountains regular strata, which consequently could not be the work of a revolution. These strata are not horizontal; they are, on the contrary almost perpendicular; and may be compared to leaves laid upon one another, so that each peak of the higher Alps might well enough be represented by an artichoke.

with the inferior mountains contribute to enlarge the surface of the earth, to irrigate it with lucid streams, to divide the lower region of the atmosphere into limited portions, to disperse the clouds, and to distribute and direct the winds which, without such a powerful obstruction, would regularly blow, with a destructive impetuosity, round the globe, in one direction only, they entertain a quantity of water, whose dispensation is ever proportioned to the heats of the summer, and which far from being desiccated by the sultriness, would, if needful, suffice to extinguish the conflagration of an hemisphere.

But what cause produces the cold that reigns at these heights? By what caprice has nature accumulated in these places of eternal serenity, ice which should only delight in the frozen regions, and in the twilight of the polar countries? Why are desolation and death the portion of those places which the great luminary that quickens and enlivens all, lights with its purest rays.

Some assigning to the earth its proper heat, the remainder of its conflagration, suppose that the mountains, as insulated masses, distant from the central focus, are subject to a more considerable loss of internal fire. Others, considering the reflection and concentration of the beams of the sun as the only cause of the heat of the plains, are of opinion that the solitary situation of the mountains is sufficient to account for the ice that glistens on their tops. Others again, rejecting without modification both these systems, pretend that the mere rarefaction of the air suffices to produce this effect. Is it because every fluid can suffer but a degree of heat proportionate to its density? Or, is it because the air more distant from the surface of the earth, and at the same time less dense, is deprived of the mixture of those different vapors, which, blending; fermenting, dissolving, and regenerating themselves in the lower region of the atmosphere, must be looked upon as acting powerfully on temperature*.

* The opinion Mr. Deluc, proposed in his late publication, without exposing, however, the foundation on which

Notwithstanding the diverse systems that might be imagined to explain this phenomenon, I think that ought to be looked upon as the most proper to explain it which assigns the most constant and uniform cause for it. Nothing indeed, is so regular as the law of nature; and the line which separates the living world from the regions of snow, is marked in every latitude by an imaginary surface, bent into a flattened spheroid, distant above the equator 2400 yards from the level of the sea, and which drawing insensibly near to the earth, intersects its real surface towards the 80th degree of latitude. Applying this rule to the Alps we shall find, that being situate at a distance from the equator exceeding the half of its distance from the pole, they must meet the region of snow at an elevation less by half than that by which this region is above the sea under the equator. Hence it follows, that if the Alps had conserved this primitive form, we might see the whole chain covered with a sheet of snow whose inferior edges would be exactly marked by the regions of vegetation, 1100 yards above the level of the sea. The situation alone of some summits, relatively to the aspects of the sun, and the activity its beams acquire when reflected by some surfaces on others, might interrupt, by some few irregularities, the uniform whiteness of this vast extent of ice.

This state, if ever it existed, could only be momentary, because forms are changeful, and there is but one regular. The same cause which produced the ice must have increased its mass; and if there is a first year, when these summits received the snows whereof part remained unmelted by the sun, there must exist on them a cause that impedes their dissolution in proportion to their accumulation. By the increase and extension of this mass of ice, some parts
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it is to rest, though he asserts that it is impossible to form any other system after having seen and examined the mountains; I must confess that it is less from my own experience than in the trust I have in that of this author, that I should find reasons to adhere to his opinion.

of it must have separated, which, rolling down the declivities of the mountains, carried the winter into a warmer region, where by their bulk they resisted the heat of our summers. The torrents swelled in proportion as the ice increased, and advanced towards the temperate zone. These torrents washed off the earth which covered the tops of the mountains, and excavated the dark precipices, whence issued those ramifications of ice, that were destined to invade the subalpine regions, and to unite into one continued chain the glaciers which till then had occupied the insulated summits only.

This is the actual state of the Alps. Were it possible to rise above their tops, and to overlook their whole mass at one view, the frozen ridges, and barren, uninhabitable places would appear more numerous than the fruitful and the habitable. Two principal and neighbouring vallies of ice, one to the North-east and the other to the South-west, would chiefly attract our notice. On the first the chain of mountains between the *St. Gothard*, the *Grimfel* and the *Schreckhorn* would appear like islands half submersed. On the other we might distinguish the dreadful rocks between the *St. Bernhard*, *Mount Velan* and *Montblanc* mantled with snow. From these two vallies we might see issue numberless ramifications, pursuing, confounding and crossing one another on all sides, uniting the larger masses with the smaller, and pervading far and wide the regions contiguous to this focus of frost. On this white plain we might observe some peaks of a different color, which, incased in the ice, seem to have secured their summits; these have, no doubt, been formerly covered with ice, which can now no more find any hold on their naked sides. Nature has freed them in their old age from the yoke of servitude. Some black spots might indicate cultivated tracts and extensive pastures; but in vain would we look for those imperceptible interstices, where the hand of industry has cut out roads and passages; and the Vallais, the largest space which is free from the ice, would appear like a narrow riband silvered by the Rhone.

On a nearer consideration, and, observed in its partial effects this deluge of ice grows more frightful. We behold it engulf gradually those huge wrecks of all ages, each portion of which attests the ravages of a century. Drawn like the veil of forgetfulness over the annals of nature, it tends to obliterate all the vestiges time has left of its passage. In whatever valley we penetrate, we are encompassed with ice, it threatens to obstruct the communications which the industrious inhabitants have formed; it invades the most fertile pastures. Like torrents, if they had their rapidity, and inconstancy; or like lava, if they were not attended by the horrors of eternal winter, these masses of ice descend along the declivities, accumulate in the hollows, and look like the tumbling-in of an immense tract of country whose fall is determined by its own weight. The inhabitant of the plain beholds with amazement the ice incrust his fields and brave the hottest rays of the sun; the herdsman fled to the bottom of the precipice, sees it with terror gain the summit of the steep which separated him from it, and vomiting on his habitation torrents and avalanches.

How sad soever it may appear, yet it is true, that the ice tends to cover the whole surface of the higher Alps, and to insulate the temperate vallies. I do not pretend to say that this increase is occasioned by the refrigeration of the globe; for the glaciers have generally outstretched the cold region that gave them birth, and subsist by their size under a warmer zone; but even the existence of these glaciers in places that could not produce them proves the extent of the original mass*. Those who gathered ripe fruit at the foot of

* In ascribing the extension so remarkable in the inferior glaciers, to the increase alone which the superior masses of snow must annually receive, and in looking upon the system of the refrigeration of the earth, as little proper to account for the continuance of these masses of ice in a temperate region, I am far from fancying that this manner of considering an insulated fact is contradictory to the most magnificent theory

the glaciers of the *Grindelwald*; who with one hand touched that of the *Montanvert*, and with the other a yellow harvest, did they not see that those fruits could not have grown out of the ice which descended from above*. But what system and what particular observations can we oppose to facts so well attested, and to so many uniform traditions? One must have seen very little of the ice, and not often spoken with shepherds frightened by its neighbourhood, not to know that ever so many glaciers bear the names of the pastures which they cover†. How many passages that were open a century ago have been choked up for ever**. All those places are well known; the registers of the communities and of families have conserved the remembrance of those public calamities which are also attested by monuments††. If all these proofs were not sufficient I might add an authority which is paramount to all others, that of the illustrious *Haller*, the *Plinius* of Switzerland; this learned man, then in his eightieth year, assured me, that he remembered to have seen from Berne, when very young, mountains clear from snow during the greatest part of summer, which are now constantly

of the world genius ever gave birth to; I mean only to say that many phenomena relative to the glaciers and their increase ought to be explained without having recourse to it.

* This refers to Let. xxxi. and xxxvii.

† The *Rosenlavi* and the *Blumlifs-gletscher* in the canton of Berne, and several others in the Vallais and the Faucigny.

** That of the *Letschberg* between the canton of Berne and the Vallais; that of the *Montanvert* and of the *Bonhomme* in the Val d'Aost; and that of the *Grindelwald*, mentioned by Mr. *Coxe*, in Let. xxxi.

†† In the parish of *Grindelwald* we see yet the bell of an hermitage, which stood formerly in the passage leading into the Vallais, now choked with ice.

covered with it*. It would be a strange abuse of some particular exceptions, to oppose to these facts the immobility of the inferior glaciers. It is true that during many centuries these accumulations have not passed certain limits, and their insensible augmentations, having always been attended by proportionate diminutions, the extremities of these variations have continually been confined to a very narrow space. Such is the glacier of the *Montanvert* and those of the *Grindelwald* and the *Furca*†. But who does not conceive that ramifications descended several hundred years below their native region, and arrived at the bottom of vallies, where the beams of the sun, reflected from all sides, must occasion to them losses, which the superimpendent ice, and the winter's cold can hardly repair? Who does not conceive that these ramifications cannot extend any further, and have reached the term to which all the other glaciers tend with more or less celerity and success. The accumulation of the superior

* In 1779 Mr. de Haller has consecrated his opinion on this subject, in his preface to Mr. *Wagner's* fine collection of views and prospects of Switzerland. To the observation which I cited on the faith of this great man, I shall add one of the same kind which seems to me decisive. From Alsace, whose situation relatively to the Alps, is the same with that of the city of Berne, these glaciers are seen terminating the horizon towards the south. The ancient inhabitants of that province, seemingly ignorant of the true name of these mountains, have given them one expressive of their appearance, they called them *Hohe Blauen*, high blues. In North America they call *Blue Mountains* the remote chain which intercepts the view from the Pacific ocean and the *Anian* straits. This denomination of high blues which is still to be found in several old maps is now fallen into disuse, because it is no more becoming to masses of glistening white contrasting the azure of the sky, whose actual appearance resembles the fleeces which we see on a summerday rise on the horizon.

* The immobility of the glacier of the *Grindelwald* cannot be very ancient, because the inhabitants remember the passage it has obstructed, and the hermitage of which they have conserved the bell. See the foregoing notes.

ice does not depend from the vicissitudes to which the inferior is subject. The latter, covering the plains, and varying with the seasons, increases and diminishes according to the capricious circumstances which rule so many things here below. In the higher regions, on the contrary, the seasons do not differ so much, and are less subject to circumstances and accidents; the laws are simple, the tendency is constant; the increase depends from the same invariable cause which has conserved the snow of the first winter in spite of the heat of the following summer*.

The influence which the accumulation of the superior glaciers has on the inferior is visible in the progress of the latter. The cause of it is obvious; a mass resting on an inclining plan tends necessarily to descend, and this tendency is promoted by the concussion of the torrents that roll under their vaults, by the humidity which the soil imbibes from the ice which covers it, and by the numberless cavities undermining its lower part, which by diminishing the extent of the surfaces, diminish also the collision. In this manner the increase of the superior glaciers feeds the ramifications which, extending over more temperate regions, lose a great deal without any acquisition; and augment gradually those which are destined to transgress the frozen region, in order to lay waste warmer countries. We owe the discovery of their

* The proportion of the winter's cold to the heat of the summer was then such, that at the end of the year the total mass of fallen snow exceeded a little that of the dissolved, which occasioned necessarily an increase in the stratum of that which resisted the dissolution. The proportion of the augmentation must also have been increased, as the cold reigning on the top of these mountains has become more intense by the annual thickening of the crust of ice; so that the snow of the hundredth winter, supported by a soil penetrated by the frost, has resisted more effectually the heat of the ensuing summer, than that with which the first winter had invested the naked ground, and which lay only exposed to the natural cold of the atmosphere.

progress to the *Marême* or *Moraine*, a heap of broken rocks, bordering on the glaciers. This inclosure was observed to consist principally of pieces of granite, although the glacier was seen among calcareous rocks, and it was surmised that it brought these fragments from the place of its birth. By comparing every year the situation of its transversal crevices, with the bordering rocks, it was found that they advanced insensibly; and a mark placed above one of those crevices was in a short time passed by the ice*.

* These observations have been made in the glaciers of the Faucigny. Fir-trees, fixed on the crevices of the ice, served for points of comparison. One of the most decisive experiments of this kind is owing to Mr. Hennin, the French minister at Geneva. By these observations the yearly progress of the ice seems to be about fourteen feet. An amazing celerity which might be attended with terrible effects, if it were the same at all heights; and if different causes did not unite to obstruct it: this law cannot be general, it must vary according to the declivities and the course of the vallies of ice; and in proportion to the pressure of the superior heaps, and their direction. This progress must also be accelerated or retarded by the temperature of the region of the glaciers; the soil more or less moistened by the thawing of the ice, must promote or impede their descent; so that the inferior ramifications, loaded with the enormous weight of snow from the upper region, being situated in vallies whose declivity is steep and excavated by the torrents underneath, must advance more rapidly than those in the frozen region. This acceleration is occasioned by their situation, and the chief means whereby nature repairs the losses, which they are subject to in it; whilst the slow progress of the superior glaciers restrains the increase which their position would allow of. Thus the mass of ice, accumulated in the superior regions, not being able to spread over the higher vallies, extends itself towards the inferior outlets, where its parts gradually dissolve; so that its annual increase, how prodigious soever it may be, produces in the glaciers but an inconsiderable one, and this trifling augmentation is very often reduced to nothing by the variableness of the seasons.

Although most of the glaciers are fed and increased, in this manner, there are, however, some, which, lying embosomed in warm vallies, receive annually a new supply of snow by the periodical fall of an avalanche, which is formed regularly above them; several of these, carried off by their own weight, slide down on a sudden, and overwhelm the pastures below. Sometimes glaciers settled in pits sheltered from the beams of the sun, where the winter's snow was entertained by that which the heats of the summer separated from the higher mountains. It is on this phenomenon chiefly that the inhabitants of the Alps found their opinion, that the smallest portion of snow, subsisting for the space of a year in any place, generates a glacier.

This slow but regular progress, which brings insensibly to the foot of the Alps the snow that gathered on their summits, is both the origin of the glaciers, and the cause of their permanency. If the snow remained in its cold mansion, and did not receive any greater supply than is necessary to repair the loss they suffer by evaporation, Switzerland would have no ice, and could not pour into the four seas, which encompass Europe, the broadest rivers of this part of the globe. If, on the contrary, this snow fell on the lower vallies, on a sudden, and ere it had acquired the consistence it receives in the middle region, by the succession of frost and thaw, it would instantaneously dissolve and lose itself in livid torrents. Nature operates not in this manner. From these high regions, the highest in Europe, she irrigates the lower countries. This irrigation, however must be regular, else it would prove hurtful. The snow accumulating on the mountains must dissolve slowly and uniformly. In order to dissolve it must descend into the lower region of the atmosphere: to melt slowly, it must be in a great mass and frozen to ice. Let us now follow this singular transformation through all its parts.

The highest mountains, those to which the name of *Glacieres* is particularly appropriated, are quite inaccessible; but the

observer distinguishes easily on the dazzling white of their crust that dull hue which characterizes the snow. There falls indeed nothing but snow from the mountains, and that which adheres to these high summits, as it can never be entirely dissolved, must remain in this state, or be candied with a thin crust of ice, formed by the agglutination of those parts of its surface, which are the most exposed to the heat of the sun. This bright and glistening crust it was which deceived some observers with respect to the covering of these mountains. The particles of which this crust is composed part easily, and often fall in form of an icy dust on the bottom of the neighbouring vallies. This is the state of the superior snows, and the first step they make in their progress towards the inferior vallies.

Directly beneath these mountains, and in that elevated basin which receives both their spoils and the snow of the atmosphere, the temperature is not so cold, and the sun, shining for some days, suspends severity of winter. Here the snow is more condensed, and more adhesive; the traces it retains of the tread are very faint. This is the immense reservoir whence the glaciers draw their supplies. Hence numberless ramifications proceed on all sides down the steep vallies in search of the plain. The snow prepared in the superior basin, has acquired a certain degree of solidity, and is become proper to undergo the proof to which it will be subjected in a more temperate region. This is the second step.

In this new abode the snow is exposed to a longer thaw, but the frost is not less severe; its mass is more and more penetrated by the water produced by the dissolution of some of its parts; but is no sooner imbibed with it, than the cold congeals, and transforms it into a kind of soft ice, which has some transparency: and here the glacier begins.

The work is not yet finished, but it tends rapidly to its perfection. Every yard, in its descent to the inferior glacier, the ice acquires an additional degree of hardness and transparency; and the glacier is in a short time entirely transformed.

If we examine, however, that part where this metamorphosis is most perfect, that is, at the foot of the glaciers; we will find that it forms not yet a quite homogeneous whole, and that it consists of two very different kinds of ice. That which forms its interior stratum, more compact and more transparent, is harder than our most perfect ice, and absolutely like it, upon the slightest stroke it will break into angular shivers with a plain surface; the other sort which composes the regular rocks that bristle the exterior surface, is whiter, lighter, and less compact; breaking into globular fragments, which are themselves but aggregates of similar parts. The inferior ice is therefore water regularly crystallized; whilst the other is but snow whose particles are agglutinated by successive thaws and frosts. The following seems to be the process of this phenomenon.

The snow, such as it falls on the earth, is a congeries of regular crystals, resembling rowels or light stars, whose six flat and pointed rays, cut at angles of 60 degrees, exhibit the crystallization of water. The heat of the sun, blunting these points, will leave to each star but its spherical kernel, and the approximation of these globules must necessarily cause the whole mass to sink. In this state we find every where the snow after it has begun to melt; it is then less porous, and less transparent. But whenever this dissolution is succeeded by frosts, the little spherical pieces of ice agglutinate, and congeal into one mass, which will break according to the sinuous interstices which the elementary globules leave between them. This kind of ice composes the exterior stratum of the glaciers, and produces the interior, formed by the congelation of the waters filtrated through the snow, and reduced into perfect ice, consisting of flat lamina uniformly inclined, hard, transparent, and breaking into sharp fragments*.

* I have seen of this interior kind of ice, it was of a dark blue color, and surpassed in hardness, heaviness, and indissolubleness the hardest that we know. These properties are

These transformations do not happen, as is commonly thought, during the heats of the summer; they are only prepared in that season. Though the snow imbibes water, the cold of the night is not intense enough to penetrate it, and to perfect the work, the thaw is but a little slackened; but winter puts a stop to it, and congeals what the summer's heat had dissolved. Hence it happens that during the temperate season, a great quantity of water not freezing, penetrates through the snow, and is depressed by its weight into reservoirs at the bottom, which either distribute it into the entrails of the mountains, to feed the sources, or pour it down over the declivities; whence sweeping off part of the melted snow, it forces its way into the plain. Although this snow be congealed into ice, it conserves, however, the form which it received from the torrent, whose impetuosity being equal to its fall, overcomes the transient obstacles which accidents may put in its way. The glacier is in its progress forced to leave it an outlet; and is itself formed by the current, whose descent is forwarded by the collision and rapidity of its waves, the torrent precedes it to mark out the places it shall occupy, and prepare the deserts.

Whilst nature is at so much expense to fertilize our plains parched by the heat of the summer, she does not forget winter, but fills her reservoirs; it is within those hollows

consequences of its antiquity, and of the continual succession of dissolution and congelation which it is subject to. Its parts, approximated gradually by the expulsion or dissolution of the air dimming its transparency, and diminishing their adhesion. In this state of purity it acquired the color of the air, or water when unmixed with any foreign body. Mr. de Pfyffer who has made some experiments on this sort of ice, assured me that it will keep its blue color to the last fragment. He has also discovered its propriety of resisting powerfully the heat. On making the same observations, I admired the wisdom of nature, in giving to this ice a hardness and indissolubleness proper to make it resist the heat of the vallies into which she made it descend.

that have no visible outlet, that she accumulates the waters which are carried by a thousand unknown conduits into the interior cavities, whence they issue in the form of springs that have not only resisted there to the winter's cold, but have acquired an adventitious heat, of which the numerous thermal waters in Switzerland are evident proofs. The same subterraneous foci to which we owe them, those half-volcanoes entertained by the slow and gradual fermentation of the minerals in the bosom of the Alps, are also the cause of those accidental holes formed under the glaciers, and of the verdure that surprises us in places which we expect to see covered with eternal snow; to them we owe likewise many brooks that are fed by the melting of the ice in the depth of winter; which, flowing over the beds of the torrents keep them open and unobstructed. To these foci of heat, and to the partial sinking of the glaciers which they occasion, we must also ascribe many of those large crevices that intersect them on all sides, and which carry the waters they receive from the superior surface into the inferior conduits. To the vaults formed by the warm exhalations we must attribute the bridges of ice, the interior lakes, and several other accidents, which such can have no constant cause, nor be ranged in the class of phenomena proceeding from the heat of the earth. This heat being a uniform and universal cause, must also be uniform and universal in its effects. If it acted alone on the interior part of the glaciers, it would always act regularly, their mass would sink every where alike; the waters proceeding from their dissolution would moisten equally the soil they cover, they would flow indifferently from all the parts of the ice which touch the earth, and join at a certain distance. There would be neither uncommon and partial cavities; nor separate reservoirs; no place could be free from snow but by its exposure to the sun, or by its being sheltered by some adjoining heights.

It has been pretended that the vaults which open at the foot of the glaciers in order to emit torrents, evince the

melting of their inferior surface; but these vaults, answering exactly to the deepest part of the valley occupied by the ice, that is to the very place, where the waters, depressed by their weight, unite, when nothing impedes their tendency, being, moreover nothing but the outlet of a conduit which traverses the whole length of the glacier, prove only the feeble resistance which the moistened snows have opposed to the flood proceeding from their dissolution, at a time when the mass was not yet in a state of congelation. The bottom of those vaults is not the birth place of these torrents, as is imagined by those who have seen but the foot of the glaciers. The two *Lutschinen*, and the torrent that swells the Rhone near its source, do not proceed from the ice of the *Grindelwald*, the *Lauterbrunnen* and the *Furca*; their sources are in the superior snows; they owe, however, to the subterraneous canal which receives and conveys them into the plain, those waters which are discharged into them by numberless crevices from all parts of the glacier, so that they are formed both by the waters of the superior surface, and by those of the inferior parts. The produce of the exterior dissolution cannot be very considerable, since the furrows and ridges on the outside are the work of the torrents formed in the first days of spring, which would not cease to flow, if the crevices did on their opening not swallow them up in order to convey them into the inferior canal.

Having represented the general forms which the glaciers owe to their origin, I shall not describe the many varieties which distinguish them; they are as numerous as the places and circumstances. Here a piece of ice loosened by the sun from the rock to which it stuck, presents itself like a high, transparent needle, whose equilibrium seems a prodigy. There a mass, arrived on the edge, arches over the precipice. In an other place this projecting mass broke off by its weight, left a perpendicular wall of ice of a frightful height. Between mountains little distant from one another the glacier is a narrow strait, farther off it is an immense sea, from

which some engulfed hills rear their heads. Higher up this sea is calm and furrowed by some large waves ; if it stretches over a narrow vale , it is a furious torrent whose billows pursue one another. This spectacle reminds us of the noise and turbulence of the sea ; yet we are surrounded by stillness and immobility.

I abandon without regret the particular description and frigid details to those who pretend to describe and explain every thing : Happy if I had acquired, in this my peregrination over a new world, the power to paint it to the imagination ; to express the sentiments with which it inspired me , and the ideas it suggested. We must not judge of these deserts by the solitude of our plains , where every thing teems with life. In the most sequestered regions , in wildernesses , where no traces of man are to be seen , I meet a family of birds , a republic of insects , which remind me of our families , and our nations with their industry , their relations , and their quarrels. The rustling of a tree , the waving of a bush , the rapid course of a torrent , and the babbling of a brook , are objects , which , by suggesting the idea of motion , the most agreeable of all , because it removes that of nought , call me back to a sense of existence. The immense deserts of the Alps are very different , their frozen labyrinths , from the cloudkept tops down to the unfathomable depths , are invested by a white mantle , the livery of the eternal winter of the pole , or rather the shroud of expiring nature ; death , who subdues here beings worthy to contend with him , bestrews it with their dreadful wrecks. An eternal silence reigns over this dreary region. The far-of fall of an avalanche , the noise of a rock tumbling from steep to steep , neither excite a scream of terror , nor scare a flight of timid birds ; and are not re-percussed through the winding mazes of these mountains overloaded with snow. Who , but an observer of nature , will believe that in this wide grave she has erected her workshop , where like a good monarch , who in a peaceful corner of his palace meditates the welfare of his people , the mother of

the world, prepares the flowers with which she enamels our plains.

The continual supply afforded by this mass of ice to the inferior ramifications, and the prodigious loss it suffers by evaporation, would hardly equal their uninterrupted increase, if the higher snow did not descend with that slowness which characterizes its regular progress, and under the solid form which it acquires by this gradual descent into the region where it is to dissolve. But the tops overloaded by their weight and unable to retain them any longer on their steep sides, shake them off in the form of avalanches, and send them down to the bottom of the vallies. Thus arrived before their time at the term to which they all tend, they are exposed without defence to the action of the heat, and dissolve with a promptitude which equalizes their loss and increase. The removal of these bodies of snow is occasioned by different causes, and the inhabitants of the country distinguish these phenomena by particular names expressive of their causes and forms. They are either *lavanges de froid*, *lavanges de chaud*; *lavanges de vent*, or *lavanges de poussière* *.

A mass of snow loosened by its weight alone from the heights on the declivity of which it hung, is called *lavange de froid*, an avalanche of cold; because it is generally in winter that the accumulation of the snow occasions its fall. It is always followed by a dreadful noise. Resistance is vain; it overwhelms habitations, nay whole villages, roots up forests, and overturns the greatest rocks. The air shaken by the fall of this enormous mass, carries desolation into those places which are sheltered from the snow: a storm is less violent; and travellers, wandering at a great distance from the avalanche, have been precipitated or choked by the impetuous blast laden with particles of ice.

* The word *lavange* is corrupted from the German *Lauwine*, by which the inhabitants of the Alps denote this phenomenon. *Avalanche*, which has the same signification is derived from *avalier*, to *avale*.

The *lavange de chaud*, or avalanche of heat, and the *lavange de poussière*, the avalanche of dust, differ little from the preceding. They derive both from the same cause; but being less compact, they do not fall in one body, and in dividing cover a larger tract of country; the snow dissolves into a light icy dust. In hot days the inhabitants hear very often a noise similar to the roar of thunder, or to the dashing of a torrent from a considerable height on a rock; it is the fall of an avalanche, descending from steep to steep, like a cascade of water reduced into spray. A warm wind blowing from the South, called by the Swiss, *Foen*, and by the Italians, *Scirocco*; the same which, in the first days of march, changes on a sudden the temperature of the air; and which in one day decks our meadows with violets, and breathes the spring abroad; brushes in a little time the summits of the Alps. Then the avalanches succeed one another without any interruption, the glaciers disgorge torrents, which, swelling the rivers, make them overflow their banks. When this wind rises, it finds above the Alps a mass of frozen air, which opposes its passage: but is forced to yield after a struggle of two days; the inhabitants of the Northern plains of Switzerland feel then a cold wind announcing the approach of its warm successor*.

The *lavange de vent*, avalanche of wind, is of all the phenomena of this kind that which assimilates the higher Alps to the Northern regions of the globe. It is a removal of snow occasioned by violent wintry storms. This snow which the cold has kept in its state of lightness, is carried off by the winds to a great distance. The aspect of the regions where these winds rage, changes instantaneously; sad is the lot of

* This wind is felt as far as Suabia and Upper-Alface, though not so sensibly. The change of the two seasons is no where so sudden, and so delightful, nor makes such a delicious impression on all living creatures; the succession is slow and gradual, and the opposite temperatures, drawing nearer by less distinct gradations, give to nature a monotonous progress, of which the soul is only apprized by vague sensations.

those who are then wandering over these heights; the traces of steps disappear, with the signals raised at certain distances to direct the traveller, who if he does not sink in this sea of snow, will cast a desponding look on a wide field, where nothing will guide his tread, and which offers no other inequalities than the huge waves with which the wind has furrowed its surface. Nature in the pursuit of her general plan overlooks partial evils; careful to disguise her immutability by an endless variety of forms, the destruction of one of those beings which she has in such profusion scattered over the world, does not interrupt her operations.

To this rapid sketch I shall confine the picture of the objects which my stay in the Alps has offered to me.

Placed in the centre of the most fruitful and temperate part of the globe, these mountains give us an idea of the most rugged countries, and the most dreary regions. Considered with relation to their constituent parts, they exhibit to us the venerable remains of the first sketch of our planet; a solid chain of simple rocks, boldly braving the shocks of the several revolutions of the earth; tranquil spectators of the rise and decay of those accidental and confused aggregations, those slow accumulations, those secondary mountains, produced by the caprices of nature, and as transient. These rocks inclose in their bosom minerals as old as themselves; and crystals, the faithful attendants of the glaciers. It is but at their foot that we find those chalky and argillous coverings, whose layers contain the remains of beings inhabiting the surface of the earth or the bottom of the sea; those ridges of hills winding between their bases, covering the primitive vallies with accumulations of extraneous matter, whose different states attest the lapse of ages, whereby their summits have been little affected. On an examination of the height of these mountains, they will exhibit numberless other phenomena. An elevation of no more than thirty yards removes us a whole degree from the equator; and we find, when passing through the different regions of the atmosphere, the same variations in

the state of air, which local circumstances such as the proximity or distance of a large body of water, or a great forest produce in the temperature of a climate, when one approaches gradually to the pole, marked by the irregularities of the position of the mountains towards the sun, the reflection from the adjoining surfaces, the distance of the ice occasion in the regular diminution of the heat. Higher up these variations are as inconsiderable as in the neighbourhood of the poles. An elevation of twelve or thirteen hundred yards, answers to the eightieth degree of latitude; and in the progress of a few hours one may feel the influence of every season, see the productions of every climate, pass through the whole scale of vegetation, and compare the birds of Italy with those of the continents and the Northern lakes; nay, we are gone beyond the coldest habitable zone. In a latitude of seventy-five degrees we meet with forests; at an elevation of eleven hundred yards there is no tree to be seen on the Alps. Here the cold is attended by the diminution of the column of the air; there it is entertained by the obliquity, of the rays of the sun. Vegetable life seems to yield rather to the impression of the first of these circumstances. This would be the most dreary region, were it not cheered by the serene sky, and lighted by the brightest rays of the sun.

Existence is not at all painful in the heart of these deserts. A temperature afforded by a cloudless sky must ever be a benefit, and the cold of the atmosphere is supportable; an air that may be breathed notwithstanding its rarefaction; waters that have preserved the purity they acquired when rising to the clouds, because they have never traversed in their fall those noxious vapors which poison the lower part of the atmosphere. These afford to the thirsty traveller

Mr. Springli of Berne has been at great pains, and at a very considerable expense, to collect the birds of the Alps. His collection consists of about five hundred pieces; among which there are some species particular to all the climates, from the South of Italy to the North of America.

a refreshing draught of innoxious coolness*. The body is quickened into new life; strength revives; tranquillity succeeds to uneasiness; the body and the mind undergo a transformation extending and multiplying their faculties. All this will perhaps appear exaggerated to people who never left their plains†; it may, however, be proved by those who, visiting the mountainous parts of the globe, must certainly have experienced, in those high regions, a kind of regeneration, have felt their minds and bodies freed from all weakness and infirmities; and will readily acknowledge that, at no period of their lives, even in the age of passions, and in circumstances the most proper for firing the fancy, they never found themselves disposed to that kind of enthusiasm which alone begets sublime ideas. Who on beholding the immensity of the heaven and the littleness of our planet, could ever think without contempt on what we call great, and without pity on what we deem important? Nor is this in the least surprising; for every thing is here of a gigantic size; the eye lost in the infinite chaos of the mountains which it overlooks, fancies to see an universe. This universe however is but a point, when compared to the wide azure expanse in which we wander. Nothing diverts, nothing undeceives the mind enraptured by objects so awfully sublime. The solemn

* This property of the waters drawn out of the crevices of the glaciers is proved not only by the experience of all those who drank of them, but also by the judgment of the Swiss physicians. I do not know the reason they assign for this phenomenon; but, having myself tasted them very often, I must declare, that their innoxiousness seems to me to proceed less from their quality than from the disposition of the body, which, being surrounded at these heights, by an atmosphere very rarified, does not receive from the friction of its parts a degree of heat comparable to that which it is susceptible of in the plains. Besides repose is not very long in these regions; activity being continuous, and the cooling momentary, transpiration cannot be long interrupted.

† See Rousseau's *Héloïse*, Let. XXIII.

stillness, which reigns in these places void of life and motion, which the noise of the habitable world cannot reach; the view of these unfathomable abysses, these towering unshaken rocks, that constantly withstood the various changes, revolutions and vicissitudes that peopled and desolated by turns their vallies; all concur to heighten our contemplation, and to raise it to that pitch which it attains, when the soul, soaring above the abyss of time, becomes coeval with all ages and with all beings. In vain reason would attempt then to count the years. The solidity of these enormous masses, compared to the accumulation of ruins by which they are surrounded, frightens, and distracts it. Imagination taking up, what reason was compelled to abandon, conceives in this long succession of periods an image of eternity. What becomes of the objects which busy, enchant and astonish us here below, when compared to such distant periods?

Our vastest ideas, our noblest sentiments proceed from the delusions of fancy; we would be incapable of conceiving a sublime idea, or performing a brilliant action, did it not continually enlarge and aggrandize these sublunary scenes; transform the finite into infinite, time into eternity, and fading laurels into immortal crowns.

L E T T E R 41.

Account of the Bouquetin, or Mountain-Goat.

I Observed at Michael Paccard's, a guide of Chamouny, a head and horns of the male *bouquetin*, or mountain-goat, and stuffed specimens of a female and a young one.

As this animal is extremely rare, and inhabits the highest and almost inaccessible mountains,

the descriptions of it have been very inaccurate and confused. But a new light has been lately thrown on the subject by Dr. Girtanner of St. Gallen, and by M. van Berchem, secretary to the Society of Sciences at Laufanne; and although these two naturalists differ in some instances, yet their joint labors have assisted in ascertaining the nature and œconomy of this curious animal. The following account, therefore, of the bouquetin, is drawn principally from their observations in Rozier's Journal, and from additional information obligingly communicated to me by M. van Berchem himself.

The elder naturalists speak of the bouquetin as of an animal well known, and in their time by no means uncommon on the high alps of Switzerland, especially in the canton of Glaris and in the country of the Grisons. On the town-hall at Glaris, there is still a pair of horns of an extraordinary length, belonging to an animal of this species, formerly killed in the canton. These horns are probably the same which Ray saw in the last century, when the natives informed him, that the breed was extinct in that canton.

That this animal was found among the Grisons, appears from a letter in the possession of M. de Salis Seervis, dated the 14th of October, 1574, in which the Archduke Ferdinand of Austria requires from his bailif of Castels, in the Pretigau, two bouquetins alive; adding, that he had received several from his predecessors. About forty years after the date of this letter the animal began to be rare; for a decree in the year 1612 prohibits the chase of the bouquetin under a fine of fifty crowns, and that of the chamois from New-year's

day to St. John, under the penalty of ten crowns. Sprecher, in his *Pallas Rhetica*, published in 1617, relates that the chase of the bouquetin was not uncommon in his time, in the vallies of Pregalia, Vals, and Upper Engadina. Another law of 1633, confirmed in the following year, inflicts corporal punishment on those who kill a bouquetin. But these severities could not preserve the breed; and it is probable that this was the epoch of their destruction, when the fear of their being extinct prompted government to forbid the chase¹. And it is certain, that within the memory of the present generation, no bouquetins have been found in a wild state in the country of the Grisons.

This animal is now chiefly found upon that chain which stretches from Dauphiné through Savoy to the confines of Italy, and principally on the alps bordering on Mont Blanc, which is the most elevated part of that chain. Its particular haunts are the Valley of Cormayor to the south of Mont Blanc, those heights which lie between Mont Blanc and the frontiers of the Vallais, and the mountains which border the Val Savarenche; but it is met with more abundantly in the mountains of the valley of Cogne, which is the frontier of the valley of Dent in Piedmont; and almost

¹ Franciscus Niger, in his description of the Grisons, as quoted by Conrad Gefner, says, that they spare this animal in hunting, because it is the armorial bearing of the country.

“*Parcitur hic Capricorne tamen tibi, Panos amice,*

“*Arma quod exornes, & pulchra insignia gentis,*

“*Hinc longam hinc vitam vivens, ingentia jactas*

“*Cornua, perque plicas rugosa, repandaque in armos,*

“*Formosusque nigris villis in montibus erras.*”

always frequents those parts that have a southern aspect.

The several names by which the bouquetin is known in different languages, are, in Greek, by Homer and Ælian, Αἰξ αἰγρος²; Latin, *Ibex*, which name has been adopted by most modern naturalists; Italian, *Capra Selvatica*; German and Swiss, *Steinbock*, or Rock-goat, the female, *Etagne*, or *Ybschen* and *Ybschgeiss*, perhaps from the Latin *Ibex*; Flemish, *Wildgeit*; French, *Bouquetin*, anciently *Bouc-estain*, the German name reversed. Belon named it *Hircus ferus*; Brisson, *Hircus Ibex*; Linnæus, *Capra Ibex*; Pennant, the *Ibex*; and Dr. Girtanner *Capra Alpina*. I have adopted the name of *Bouquetin*, because it is the provincial appellation of the animal in the Alps.

The systematic naturalists agree in taking the specific character of the bouquetin from the beard, and the horns, which they describe as knobbed along the upper or anterior surface, and reclining towards the back.

The male bouquetin is larger than the tame goat, but resembles it much in the outer form. The head is small in proportion to the body, with the muzzle thick, compressed, and a little arched. The eyes are large, round, and have much fire and brilliancy. The horns large, when of a full size weighing sometimes 16 or 18 pounds, flattened before and rounded behind with one or two longitudinal ridges, and many transverse ridges; which degenerate towards the tip into

¹ Most naturalists affirm that Homer calls this animal Αἰξ ἰξυλος, whereas he styles it Αἰξ αἰγρος, the wild-goat, adding the epithet ἰξυλος, or wanton. *Iliad* Δ, v. 105.

knobs; the color dusky brown. The beard long, tawny, or dusky. The legs slender, with the hoofs short, hollow on the inside, and on the outside terminated by a salient border, like those of the chamois. The body short, thick, and strong. The tail short, naked underneath, the rest covered with long hairs, white at the base and sides, black above and at the end. Space under the tail in some tawny, in others white. The coat long, but not pendent, ash-colored, mixed with some hoary hairs: a black list runs along the back; and there is a black spot above and below the knees. Its color, however, like that of other animals, must necessarily vary according to its age and local circumstances.

The female has been little noticed among naturalists. She is one third less than the male, and not so corpulent: her color is less tawny: her horns are very small, and not above eight inches long. In these, and in her figure, she resembles a goat that has been castrated whilst young. She has two teats, like the tame she-goat, and never has any beard, unless, perhaps, in an advanced age. The young ones are of a dirty grey color, and the list along the back is scarcely discernible.

There is a stuffed specimen of the male bouquetin of the alps in Mr. Parkinson's, late Sir Ashton Lever's, Museum, of which I have here given some of the principal dimensions, as they are not to be found in any author that has fallen under my observation, except in Buffon's *Histoire Naturelle*; and those were taken by Mr. Daubenton from a young subject.

	Feet. Inches.	
Length of the head from the lower jaw to the space between the horns —	0	9 $\frac{1}{2}$
Length from the root of the horns to the base or origin of the tail —	4	4
Height at the shoulder before —	2	5 $\frac{3}{4}$
Height at the shoulder behind —	2	7 $\frac{1}{8}$
Circumference of the body next to the fore-legs — — — — —	3	6
Circumference next the hind-legs —	3	2
Circumference in the middle —	3	8
Circumference of the neck, close to the shoulders — — — — —	2	3 $\frac{1}{2}$
————— between the ears and the horns — — — — —	1	4

The horns being so remarkable a part of this animal, I shall here add the measurement, not only of those belonging to Mr. Parkinson, but of several pairs which are deposited in the British Museum. Those in the second and third columns certainly belong to the bouquetin of the alps. Their color is a dusky brown. The first of these is very flat before; the second is not so flat; neither the longitudinal nor transverse ridges are so very strongly marked: these are evidently the horns of a very old animal. The horns in the fourth column belong also to the bouquetin; but probably from some other country. Their color is black; they are much flatter on the sides, and narrower before than the others; the longitudinal ridge is very strongly marked, and the transverse ridges stronger and more numerous, I cannot observe more than one² longitudinal

² Most naturalists affirm, that the horns are marked with two longitudinal ridges; all those that have fallen under my

ridge in any of the horns which I have examined, the exterior part of the front being universally rounded off, and the transverse ridges run very little into the sides. The horns in the fifth column belong unquestionably to the *Ægagrus* of Pallas, which is not improbably a variety of the bouquetin. Two fine pairs of these horns were given to the Museum by the late duke of Northumberland. They have no anterior flat face, but a sharp ridge, with a few knobs in front, about nine in number, and very distant from each other; they are streaked transversely, more evidently towards the end. Their extremities are much arched, with the points turning inwards. The color is the same with those of the alpine bouquetins.

DIMENSIONS of the horns in Mr. Parkinson's, late Sir Ashton Lever's, Museum (n. 1.) and in the British Museum.

	N ^o 1.	N ^o 2.	N ^o 3.	N ^o 4.	N ^o 5.
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
Rectilinear direction, or chord, from the root to the tip — —	2 1½	1 9	2 0	1 8	1 6
Arc, or length measured along the curvature —	2 8	2 6½	3 6	3 0	3 9
Circumference at the base — — —	0 0½	0 8	0 10½	0 9	0 9
Distance between them at the base — —	0 0½	0 1	—	—	0 0½
Distance between them at the tips — —	1 9¾	2 2	—	—	—
Number of transverse ridges. — —	24	12	20	24	—

observation have only one interior longitudinal ridge, and a faint mark on the exterior edge, which is probably taken for the second longitudinal ridge.

It is a common notion of the hunters, adopted by many naturalists, that the age of a bouquetin may be estimated by the number of transverse ridges or knobs in the horns. M. van Berchem, however, assures me, from his own observations, that this is a vulgar error; and that its age can only be ascertained by the number and form of the teeth, as in sheep and goats. This mistake has also occasioned its term of life to be supposed much longer than it really is. This animal increases in bulk to the age of four years; according, therefore, to the system of the Count de Buffon, that the age is about seven times the growth, its life is twenty-eight or thirty years.

In a state of tranquillity, the bouquetin commonly carries the head low; but in running holds it high, and even bends it a little forward. He mounts a perpendicular rock of fifteen feet at three leaps, or rather three successive bounds of five feet each. It does not seem as if he found any footing on the rock, appearing to touch it merely to be repelled, like an elastic substance striking against a hard body. He is not supposed to take more than three successive leaps in this manner. If he is between two rocks which are near each other, and wants to reach the top, he leaps from the side of one rock to the other alternately, till he has attained the summit. He also traverses the glaciers with rapidity; but only when pursued, for otherwise he avoids them.

The bouquetins feed, during the night, in the highest woods: but the sun no sooner begins to gild the summits, than they quit the woody region, and mount, feeding in their progress, till they have reached the most considerable heights.

They betake themselves to the sides of the mountains which face the east or south, and lie down in the highest places and hottest exposures: but when the sun has finished more than three quarters of its course, they again begin to feed, and to descend towards the woods; whither they retire when it is likely to snow, and where they always pass the winter. The bouquetins assemble in flocks, consisting at the most often, twelve, or fifteen; but more usually in smaller numbers. The males which are six years old and upwards, haunt more elevated places than the females and younger bouquetins; and as they advance in age are less fond of society; they become gradually hardened against the effects of extreme cold, and frequently live entirely alone.

In summer they feed principally on the *genipi* and other aromatic plants which grow in the high alps; and in winter they eat the lichens, and browse on bushes and the tender shoots of trees. They prefer those spots where the dwarf birch and alpine willows grow, and where *rhododendron*, dwarf rosebay, *thalictrum*, meadow-rue, and *saxifrages*, abound.

The bouquetins having their fore-legs somewhat shorter than the hind-legs, naturally ascend with greater facility than they descend; for this reason nothing but the severest weather can engage them to come down into the lower regions, and even in winter, if there are a few fine days, they leave the woods and mount higher.

Winter is the season of love with them, and principally the month of January. The females go with young five months, and consequently produce in the last week of June, or the first of

July. At the time of parturition they separate from the males, retire to the side of some rill, and generally bring forth only one young, though some naturalists affirm that they occasionally produce two.

The common cry of the bouquetin is a short sharp whistle, not unlike that of the chamois, but of less continuance: sometimes it makes a snort, and when young bleats.

The season for hunting the bouquetin is towards the end of summer, and in autumn, during the months of August and September, when they are usually in good condition. None but the inhabitants of the mountains engage in the chase; for it requires not only a head that can bear to look down from the greatest heights without terror, address and sure-footedness in the most difficult and dangerous passes, and to be an excellent marksman, but also much strength and vigor, to support hunger, cold, and prodigious fatigue. The most determined hunters of bouquetins live in the mountains of the Lower Vallais: for instance, the natives of Servan, a village in a wild and picturesque situation, four leagues from Valorine, and two or three from Martigny, are hunters, and the bouquetins being no longer found in their mountains, they hunt in those of the valley of Aost, obtaining a permission for that purpose from the inhabitants.

Two or three hunters usually associate in this perilous occupation: they are armed with rifle-barrelled guns, and furnished with small bags of provisions; they pass the night among rocks at considerable heights; they erect a miserable hut of turf, where they lie without fire or covering,

and on waking not unfrequently find the entrance blocked up with snow three or four feet in depth. Sometimes, in the pursuit of a bouquetin, being overtaken by darkness amid crags and precipices, they are obliged to pass the whole night standing, embraced in order to support each other, and to prevent themselves from sleeping. As the bouquetins ascend into the higher regions very early in the morning, it is necessary to gain the heights before them, otherwise they scent the hunter and betake themselves to flight: it would then be in vain to follow them, for when once they begin to escape, they never stop till they think themselves entirely out of danger, and will even sometimes run for ten or twelve leagues.

The female shows much attachment to her young, and even defends it against eagles, wolves, and other enemies; she takes refuge in some cavern, and presenting her head at the entrance of the hole, thus opposes the enemy.

When a bouquetin is shot, the hunters let it cool upon the spot, and then embowel it, putting the blood into one of the entrails, which is esteemed by the peasants a sovereign remedy in pleurifies and some other disorders. A large bouquetin thus embowelled will weigh 180 or 200 pounds. A female weighs only from 70 to 80 pounds.

Some naturalists are of opinion, that the diminution of the race of bouquetins in the Alps is owing to his size, the monstrous length and weight of the horns, which impede him in his course; because he is driven into places where he can scarcely procure sufficient nourishment during

great part of the year, where his sight becomes debilitated, and is frequently lost by the strong reflection of the sun from the ice and snow. They consider this animal rather as a native of the subalpine regions, which are covered during summer with the finest herbage, and where the bouquetins and chamois probably pastured in tranquillity, when only the lower vallies and plains were inhabited.

On the contrary, it is maintained by others, that the bouquetin is endued with strength proportionate to his size; and though he is inferior to the chamois in liveliness and agility, yet he is by no means deficient in activity; that his horns, though large and weighty, yet from their reclined position do not seem to be any impediment, but rather render him essential service when he happens to fall, or purposely throws himself down precipices to avoid his pursuers. They add also, that his natural food is rather lichens than herbs; that he is particularly fond of the young shoots of trees and shrubs; and that in all the places where he inhabits, he is found in the coldest and rudest mountains, and on the steepest rocks. From these circumstances, it is not improbable, that his present situation and manner of life is an effect of nature rather than necessity. Besides, why do the chamois, who are more hunted than the bouquetin, still inhabit the less elevated regions; and why are they not driven into the glaciers? To account for the present scarcity of the bouquetin, we need only consider the number of its enemies; in men, beasts, and birds of prey. Nor is there much cause for apprehensions, that the race will be extinct even in the Alps.

But allowing that the bouquetin was no longer found in his native Alps, still we could not affirm with so much propriety that the race was extinct, as that it had migrated into a milder climate, and, with a state of domestication and more succulent food, had acquired softer manners, a form less rude, smaller and smoother horns. For it is even not improbable, that the *hircus ferus* or bouc-estain of Belon, the bouquetin of the Alps, the Siberian ibex, and ægagrus, both so accurately described by Pallas³, and the tame goat in all its different forms, are only varieties of the same species. Their difference in shape and manners may be sufficiently accounted for from a change of climate, situation, and food; they are found to couple freely with each other; and are asserted to produce an offspring which is fertile.

They all have a beard, which seems to be the great characteristic distinction of this genus. They differ more or less from each other in the shape of their horns, size, and coat, none of which can be esteemed certain specific distinctions. The greatest difference undoubtedly consists in the horns, none of them, perhaps, except the bouquetin, having a longitudinal ridge, and some of them being even without the transverse ridges. But this difference is less perceptible, in comparing the bouquetin with the Siberian ibex, the ibex with the ægagrus, and the ægagrus with the

³ Perhaps also the *capra caucasica*, described by Pallas, from the papers of Guldenstäedt, and which he represents as differing from the ægagrus, with which it has been confounded by some naturalists. See Act. Petr. for 1779.

tame goat. Nor are the horns of the Alpine bouquetin so much weightier, longer, and larger, than those of the abovementioned animals, as to form a *certain* specific distinction⁴.

But even if this difference should be still greater, it could never be admitted as forming a specific distinction. For the horns not only differ in individuals of the same species, but in the same individuals at different ages. If we were to attempt to arrange animals *solely* by their horns, the discriminations would be as endless as uncertain. But if, in the present instance, the alpine bouquetin and the other species of the goat genus should be excepted from this general assertion, we have only to add, that M. van Berchem possesses the horns of a young one, produced from the union of the bouquetin and she-goat, that are exactly similar to the horns of the ægagrus, which, as Pallas asserts, resemble those of the
tame

⁴ The horns of the bouquetin, as has been before observed, are sometimes found to weigh sixteen or eighteen pounds, to be three feet in length, and to have twenty-four transverse ridges. A single horn of a Siberian ibex weighed, according to Pallas, eight Russian pounds, which is one tenth less than an English pound, and has sixteen or eighteen transverse ridges. The horns of another full grown Siberian ibex measured 2 feet 5 inches and 5 lines, along the curvature, and 1 foot 2 inches and 1 line, in a rectilinear direction. The horns of an ægagrus measured 2 feet 2 inches and 9 lines along the curvature, and 1 foot 4 inches in a linear direction. The horns of a full grown Caucasian goat, were 2 feet 4 inches along the curvature, and 1 foot 6 inches in the linear direction. The longitudinal ridge or ridges remain then as the *only* specific difference between the horns of the alpine bouquetin and those of the other species. See the measurements in Pallas, Spic. Zool. and in his description of the Capra Caucasica, in Act. Petr. for 1779.

tame goat. Climate and nutriment must have a great effect upon the horns of animals. The female of the bouquetin has horns very like those of the tame goat. It is no wonder, therefore, if a long servitude, an inactive life, an exchange from the aromatic plants and pure air of the mountains to a gross nutriment and a moister atmosphere, should diminish the horns, alter their shape, subdue the longitudinal ridge, and convert the knobs into wrinkles.

The Count de Buffon extends the goat genus still further, and comprehends under it even the chamois; conjecturing, that the bouquetin is the male in the original race of goats, and the chamois the female. The French naturalist having, at the time when he described the bouquetin, never seen it in a full grown state, was probably induced to entertain this opinion from a faint resemblance between the female bouquetin and the chamois. But there does not seem the least foundation for this notion, the chamois being an animal totally distinct from the goats, never coupling with them, and judiciously classed by Pallas and Pennant in the genus of antelopes. His conjecture, however, that the bouquetin is the original source of all the tame goats seems to be founded; and has been adopted by the greatest part of succeeding naturalists. And as, according to the just observations of Pallas, the ægagrus approaches nearer than the bouquetin to the tame goat in its form and horns, the ægagrus may be the link which unites the bouquetin and the tame goat. May not the ægagrus be considered as a race produced from the bouquetin and the she-goat, or the goat and female bouquetin? Pallas also conjectures,

that the tame goat may possibly have been propagated from the ægagrus and Siberian ibex, which is allowed by most naturalists to be the same as the bouquetin; and Pennant remarks, with no less sagacity, that the tame goats may be derived from both, as we are assured that the ibex and the-goat will produce a similar offspring. It is also probable, that the bouquetin is the origin of all the goat genus, because it is the largest, strongest, and dwells in the most inhospitable regions. For, according to the observation of the same great zoologist, whom we have so often quoted, those animals who are natives of the coldest mountains must, on descending into the warm plains; be liable to greater changes than those who are formed for milder climates; and this circumstance seems sufficient to account for the great variety observable in the goat genus.

Some naturalists pretend, that the bouquetin cannot be the original stock from whence the goats have been produced, because, as he inhabits only the loftiest summits and rocks covered with eternal snow, and feeds only on plants peculiar to high regions, he cannot be domesticated in a variety of climates. But this opinion is contradicted by fact and experience. Stumpf, the historian of Switzerland, informs, us, that the Vallaisans near Sion bred up tame bouquetins with their goats; and Belon relates, that the Cretans tamed the young bouc-estains by giving them to be suckled by the goats. Dr. Pallas also relates, that he has frequently seen the Siberian ibex among the tame goats, and mentions

† Pallas.

one in particular at Orenburgh, which was leader of a flock, and father of a numerous offspring more resembling the females than himself. He was very different from the tame he-goats, scarcely inferior in size to a bouquetin two years old: in color and strength he resembled the wild animal; had thick horns, knobbed, not keeled above, and a long rough coat, but no where pendent, except in the beard: the black list on the back was almost obliterated. And lastly, Mr. van Berchem saw several tame bouquetins at Aigle. They were gentle and familiar; and, without being remarkably lively, were, active and graceful in all their motions. They bred with different she-goats, and Mr. van Berchem saw the young ones, which seemed to form a new race.

If these observations should be well founded, the goat genus, or race of the bouquetin, is found in a wild state along the chain of mountains that traverses the temperate parts both of Europe and Asia; on the Alps, Pyrenees, Carpathian mountains; on the Taurus and Caucasus; on the mountains of Siberia and Tartary; in Kamtchatka; on the islands of the Archipelago; in Hedsjæas in Arabia; in India; perhaps in Egypt and Lybia⁶.

⁶ A chronological list of the authors who have mentioned, described, or figured the bouquetin and ægagrus, is here subjoined.

1548. J. Rudolph. Stumpf. Gemeiner Eidgenossenschaft Beschreibung. Zurich, folio. A good account, translated into Latin, inserted in Gesner's work, and transcribed by many succeeding naturalists.

1551. Conradi Gesneri Historia Quadrupedum. Tiguri, folio. At page 331, &c. is an ample account, from the ancients, Stumpf, and others, with a small figure. At page 1099, however, it is tolerably well figured.

LETTER 42.

*Journey to Geneva—Pays de Vaud—Lausanne—
Felix the Fifth—Vevey—Tomb and Character
of General Ludlow—Clarens—Meillerie.*

HAVING quitted the delightful vale of Chamouny and its magnificent scenery, we continued our route towards Geneva. As we proceeded, the height of the mountains gradually diminished;

1554. Belon Observations. French edition, p. 20. A good description of the animal in Crete, with a moderate figure. — Latin edition, by Clusius, 1605, p. 20. The figure small and very indifferent.

1617. Sprecher Pallas Rhetica.

1621. Ulyssis Aldrovandi Quadrupedum Bifulcorum Historia. p. 730. fig. 732. Bad.

1657. Joan. Jonston, M. D. Historia Naturalis de Quadrupedibus Amstel. folio. Page 53. t. 25. f. 1. and f. 28. f. 3, the latter from Gesner.

1674. Olearii Gatterfische Kunst Kammer. Tab. 10. fig. 1. Head and horns.

1677. Charletoni Exercitationes. Oxon. folio. Pag. 10.

1680. Joh. Jac. Wagner, M. D. Historia Naturalis Helvetiæ curiosa. Tiguri, 12mo. At p. 176. a short account.

1693. Jo. Raii Synopsis Quadrupedum. Lond. 8vo. At p. 77. a short description.

1734. Représentation des Animaux de la Ménagerie de S. A. S. Monseigneur le Prince Eugene. Figures of two males, the female and two young ones, in the last plate. They are called Chamois, but are bouquetins.

1740. Ridinger Abbildung der Jagtbaren Thiere, tab. 11.

1748. Linnæi Systema Naturæ, Holm. 8vo.

1751. Klein Historia Quadrupedum, p. 16. Description from Gesner.

1756. Guil. Henr. Kramer Elenchus Vegetabilium & Animalium per Austriam Inferiorem observatorum. Viennæ, &c. 8vo. p. 321.

and the several vallies, through which we passed, were agreeably diversified in their figures and productions. We followed the course of the sonorous and violent Arve; and near Salenche we came to a descent, where on our right hand we descried a small lake, the situation whereof is extremely picturesque; and whose borders, skirted with wood, are pleasing and diversified. From hence we descended into the plain, which continues almost perfectly level to Geneva. Salenche lies at the bottom of a broad valley, which here contracts to a narrow pass. Tradition says, that

Briffon *Regnum Animale*, 4to. p. 64.—8vo. 1762.
p. 39.

1764. Buffon *Histoire Naturelle*, 4to. vol. xii. p. 136. tab. 13.
a bad figure of a young one; tab. 14. a good pair
of horns.

1766. Caroli a Linne *Systema Naturæ*, edit. 12. Holm. 8vo.
p. 95.

1771. Pennant's *Synopsis of Quadrupeds*, 8vo. p. 13.

1776. P. S. Pallas *Spicilegia Zoologica*. Fascic. undecimus
Berol. 4to. p. 31. t. 3.—and t. 5. f. 4. contains descriptions of the ibex and ægagrus, and gives figures of the horns of the Alpine and Siberian bouquetin, and of the ægagrus.

1777. Erxleben *Systema Regni Animalis*. Lipsiæ. 8vo. p. 261.

1777. Zimmerman's *Specimen Zoologiæ Geographicæ Quadrupedum*. Lugduni Bat. 4to. p. 166.

This curious and learned work, improved and enlarged, was published in 1780, by the author in the German tongue, under the following title:

Zimmerman's *Geographische Geschichte*, &c. 3.
vols. 8vo. Leipfic. 1780.

1781. Pennant's *History of Quadrupeds*. Article Ibex and Caucasian Goat.

1786. Rozier *Observations sur la Physique, sur l'Histoire Naturelle*, &c. Par. quarto. tome 28, 29. Girtanner, Van Berchem, & Guldenstædt.

1787. Pennant's *Arctic Zoology*.

this little plain was once a lake; and indeed its form, and the quality of the soil, seem to justify tradition: great part is laid waste by the unruly *Arve*, which frequently overflows its banks; and the rest is mostly covered with fruit-trees⁷.

⁷ If it is true that this small plain has formerly been a lake, those that dwell on the banks of the *Arve* to its conflux with the *Rhone*, and lower down, have every reason to deplore its desiccation. Lakes were intended by nature as checks to the impetuosity of the torrents; they are the laboratory where they purify; and whence they issue to spread fertility over the regions which they water. The following observations on the torrents of Switzerland were communicated to me by a traveller who examined the nature of this country with philosophical eyes. The barrenness which they occasion he ascribes not so much to their overflowings, as to the nature of the mud which they leave behind. They roll down from the higher grounds a kind of calcareous earth which is very unfriendly to vegetation, and renders their waters turbid and unwholesome. By these inundations their banks are soon changed into wastes destitute of grass, and producing only a few straggling willows and aquatic shrubs of no value. But whenever they meet a lake, they depose their mud, slacken their course; and their overflow occasions but a momentary desolation, which is soon repaired by a greater fertility. The *Arve* offers, in the valley described by Mr. Care devastations of the first kind. The *Roman* when issuing from the lake of Geneva, is a torrent of the second species; but it has scarce taken possession of its new bed, when it is joined by the muddy and turbulent *Arve* which swells it, and causes it to drown the neighbourhood.

The *Kandel*, issuing like the *Arve* from the highest glaciers, and crossing with the same impetuosity a similar valley, fell formerly into the *Aar* below the lake of Geneva. The same ravages were the consequences of this junction. About sixty years ago the government of Berne caused a channel to be dug for the *Kandel*, which carries it in to the lake of *Thun*. This canal was cut through a mountain at an immense expense of labor and money. The plain of Berne has not once been laid waste since; the torrent loses its fierceness, and after having deposited its mud in the lake, issues

Not far from Magland we stopped to admire a beautiful fall of water, called the cascade of Arpenas⁸, which rushes, like the Staubbach, from an impending rock. When I saw it, there was a considerable wind, which drove the torrent, soon after its leaving the rock, at least an hundred yards out of the perpendicular direction, into an almost imperceptible spray; I then beheld it trickling down the sides of the mountains in a thousand little streams, which united at a ridge; and from thence formed three cascades. The body of water was much more considerable⁹ than that of the Staubbach; and the fall appeared to me altogether as high. Between Magland and Cluse we took a guide to conduct us to the cave of *la Balme*. Though the ascent was not very long, yet it was so steep that we were nearly an hour in reaching it: we then scrambled along a precipice, from which we mounted a ladder; and by the aid of the branches of a nut-tree growing from the rock, we pulled ourselves into a natural cavern more than a quarter of a mile in length,

out again with the *Aar*, as transparent and regular in its course. RAMOND.

⁸ In the language of the country the *Nant d'Arpenas*. Mr. Bourrit, in his *Description of the Glaciers of Savoy*, has estimated its height at 550 toises; comprising in his computation the whole space the river runs over either falling or rolling. But the trigonometrical measurement, that has been taken of this fall by Messrs Trembley and Pictet, in presence of Mr. de Saussure, fixes its absolute height at 800 feet. RAMOND.

⁹ It may be necessary to apprise the traveller, that, in dry summers, this cascade is sometimes almost destitute of water, lest, seeing it under that circumstance, he should conceive the description in the text to be too much exaggerated.

and forming various branches that led into lofty vaults and spacious openings; but the sight of which did not answer the trouble required to enter it.

We passed the night at Cluse, which is situated by the side of the Arve; and the next morning came down the banks of that river to Bonneville, the capital of Faucigny: it stands also upon the Arve, at the bottom of a chain of rocks, which from this place diminish into hills. All this part of Faucigny, as also a small strip of Chablais through which we passed, is a rich plain, that produces wine and corn in great plenty; but is neither populous nor well cultivated. By the little village of Chene we entered into the territory of Geneva: the sudden change from the poverty of the Savoyards to the neatness and ease of the Genevans, the populousness of the country, the richness of its cultivation, and the number of country-seats scattered about the fields, were circumstances, that affected me with a pleasing satisfaction.

As I propose visiting Geneva again, in my way to the south of France, I will defer giving any account of that interesting town until my return.

We went from Geneva to Crasli, a small village in the Pays de Vaud, where we passed a day with an English gentleman, who has taken a house for the summer in that delightful spot. In our way to Crasli we passed through Versoi, a little village in the French territories, upon the lake of Geneva: it goes by the name of *Choiseul's Folly*. Geneva having fallen under the displeasure of France; that minister endeavouring to take advantage of the troubles in 1768, laid a

plan to ruin the town, and to monopolize the whole trade of the lake. Accordingly he fixed upon Versoi as a situation the most proper, upon which to build a large town. For this purpose, he began by sinking a pier and making an harbour: he constructed also a frigate; marked out the streets; sent a considerable quantity of stone to build the houses; ordered a garrison, and erected huts for them, in which they continued some time. Nevertheless, when the harbour was nearly finished, and government had expended about L. 125,000, the scheme was relinquished.

The road from Geneva to Lausanne runs through the *Pays de Vaud*, a region of which historians and travellers speak with rapture; particularly of that part which borders upon the lake of Geneva: and indeed a more delightful country cannot well be imagined. It is, almost the whole way, a gradual ascent from the edge of the lake, richly laid out in vineyards, corn-fields, and luxuriant meadows; and checquered with continued hamlets, villages, and towns: the shores are generally of the cleanest gravel; and the water is of so fine a transparency, that you may see the bottom to a very considerable depth.

We passed through Nyon, which stands delightfully upon the edge of the lake, and in the very point where it begins to widen. It was formerly called *Colonia Equestris Noiodunum*; and as a proof of its antiquity, several Roman inscriptions, and other ancient remains, have been frequently discovered in the out-skirts of the town. In this part the lake forms a beautiful curve, happily alluded to by Lucan, where he

mentions the army of Julius Cæsar striking their tents, which were posted on the borders.

*Deferuere CAYO tentoria fixa Lemano*¹.

All the possessions in this country formerly belonging to the duke of Savoy, were wrested from him in the war, which the canton of Berne declared against him, in 1536, in defence of Geneva: and in the same year the reformation was introduced. From that period all the Pays de Vaud, excepting the common bailliages of Granson, Orbe, and a small portion of it which was ceded to Friburgh, has been subject to Berne, and makes part of that canton.

Morges, which is situated at the extremity of a beautiful bay, is the neatest town in these parts. The environs are extremely pleasant; the banks of the lake form an amphitheatre gently rising to the Jura; and Mont Blanc presents itself through an immense opening in the opposite chain of rocks, which seems to have been formed by nature in order to exhibit a sublime perspective of that beautiful mountain. Near the town is a lime-tree of a great size, being twenty-four feet four inches in circumference, and with branches of magnificent extent; it has a companion about three feet less in girth. Mr. Pennant informs me, that "this tree is a native of Switzerland, and of many other parts of the continent; that it was imported into England before the year 1562; one being described by Dr. William Turner as growing in a park near

¹ "They strike their tents and quit the hollow bend
"Of Leman's lake."

Colchester; that one thirty-six feet in circumference grew near the great church at Berne; it was planted about the year 1410; and its hollow trunk, still putting forth leaves, was to be seen in the year 1702². The Germans, in old times, were fond of planting the lime before their churches and in the market-places, on account of its grateful shade. This tree is now grown much out of use; yet the Romans esteemed it so highly, as to say that it was employed for a thousand purposes, *tiliæ ad mille usus petendæ*. A sweet juice exudes from the leaves and bark, from which the Poles extract a honey called by them Liepiz³. Bees are also fond of the flowers; for that reason Virgil, in his beautiful description of the industrious Corycian, places the lime and the pine in the neighbourhood of his hives."

Lausanne contains about seven thousand inhabitants: it is built upon an ascent so steep, that in some places the horses cannot, without great difficulty, draw up a carriage; and foot-passengers ascend to the upper part of the town by steps.

² A large lime is to be seen on the heights above Villars, a seat belonging to Mr. Graffenred of Berne, near Morat. Its girth measures at least thirty-six feet in circumference, and its height is not less than ninety feet. It is very ancient, as it was lopped in 1550, for the sake of the bark. The traveller who visits this tree, will be no less gratified with an extensive prospect, commanding the lakes of Morat, Neuchatel, and Bienne, and a stupendous chain of snowy alps.

³

———— cogere pressis

Mella favis; illi tiliæ, atque uberrima pinus.

But these inconveniences are amply compensated by the sublimest views in nature, commanding the lake of Geneva, the Pays de Vaud, and the rugged coast of Chablais.

The same year in which part of the Pays de Vaud was conquered from the house of Savoy, the bishop of Lausanne, retiring from the town, the inhabitants put themselves under the protection and sovereignty of the canton of Berne; which confirmed and augmented their privileges. At present, Lausanne is governed by its own magistrates; has its own courts of justice; and, what is very singular, the citizens, who possess houses in the principal street, enjoy the privilege of pronouncing sentence in criminal causes. The criminal is tried by the civil power: if he is found, and acknowledges himself guilty, the burghers of this street assemble; one of the magistrates pleads in defence of the prisoner, and another against him; the court of justice give their opinion upon the point of law; and the majority of the citizens, possessing houses in the principal street, determine the penalty. If the punishment is capital, there is, according to the letter of the law, no pardon, unless obtained within twenty-four hours from the sovereign council of Berne; although it generally happens, that eight days are granted for that purpose. When the criminal is seized within the jurisdiction of the town; the fact is tried, and the burghers pronounce sentence, in the town-hall: in this case there is no appeal. But, when he is taken within the district of the bailif, they assemble in his house; and an appeal lies from their determination to Berne. I have been the more particular in my inquiries concerning the

mode of this criminal process, from the strong resemblance it bears, in some respects, to our trial by juries.

Here is an academy for the students of this country: professors in every science are appointed by government; and there is a tolerable library for the use of the public.

I have several times had the good fortune to meet Tissot, the celebrated physician of this place; well known in the literary world for his excellent writings upon several medical subjects. His conversation is uncommonly interesting; as, besides his skill in his profession, he is well versed in every branch of polite literature. His private character is no less respectable than his public; and he is as much esteemed for his great humanity as for his superior knowledge.

The church of Laufanne, formerly the cathedral, is a magnificent gothic building, standing on the most elevated part of the town. It contains, among many other sepulchres, the tomb of Amadeus the Eighth, duke of Savoy, styled the Solomon of his age; but more known by the name of the anti-pope Felix the Fifth; who exhibited a singular instance in the annals of Europe, of a personage *twice* abdicating the pomp of sovereignty, and *twice* retiring to a private station.

Having passed his early youth and opening manhood in the pursuits of ambition, he enlarged his dominions by the acquisition of the Genevois and Piedmont, and obtained an increase of rank by the erection of Savoy into a dutchy. Yet in the midst of his greatest success, and when fortune seemed most propitious, the sudden death

of a beloved wife, and a narrow escape from assassination, inspired him with such a disgust of the world, that he resigned, in 1434, the administration of his estates to his eldest son; and, accompanied with a few lords of his court, retired to a palace at La Ripaille, on the borders of the lake of Geneva. In this palace, which he called an *hermitage*, he enjoyed, with an apparent indifference to the affairs of the world, a calm and tranquillity that seemed incompatible with his former aspiring ambition; until he was suddenly called forth to public notice in a more exalted station.

The council of Basle having deposed Eugenius the Fourth, induced, according to some authors, by the reputation which Amadeus had acquired for sanctity, influenced, according to others, by his largesses and intrigues, raised the *hermit* of La Ripaille to the papal throne. This event took place in 1439: the new pontiff quitting his favorite retreat, accepted the proffered dignity, either with a real or affected reluctance, and assumed the name of Felix the Fifth.

The era of his disputed pontificate was marked with turbulence and anarchy. In order to avoid the storms which agitated Europe, and to favor the natural indolence of his temper, he frequently retreated to his beloved hermitage, and directed the affairs of the church from that sequestered corner. Conscious at length that his acceptance of the papacy served to widen instead of healing the schism of the church; finding that he was opposed by the most powerful princes of Europe; that, on the death of his rival Eugenius, the cardinals of Rome had chosen another pope; and being ill supported by the remains of the

council of Basle, he terminated the schism by resigning the papal tiara in favor of Nicholas the Fifth. In this transaction he proved his talents for negotiation by obtaining the following conditions: that he should enjoy the next rank to the pope; that he should be appointed vicar of the Roman see; and that all the acts passed in his pontificate should be valid. On his resignation he fixed his residence at La Ripaille, and died in 1451.

Felix the Fifth has shared the fate of many equivocal characters. By some he is represented as a saint, by others as covering the most ambitious designs under the mask of sanctity; by the former, his residence at La Ripaille is described as the retreat of religious austerity; by the latter, as the seat of luxury. In this, as in most other cases, both parties seem to have exceeded the truth. On reviewing the principal events of his life, we may conclude, that a palace built by a sovereign prince, in which he was accompanied by many lords of his court, where he instituted an order of knighthood, and where he resided with the pomp and dignity of a sovereign pontiff, could be no common *hermitage*; and that he assumed the name, rather than passed the life of a *hermit*; while the power and rank which he secured to himself, on his resignation of the papacy, sufficiently demonstrate, that he never intended to renounce the world. On the contrary, should we admit, that his life at La Ripaille was not embittered by penance and mortifications; yet as no contemporary authors, even those who were by no means partial to his character, have stigmatized his retirement, we ought not hastily to conclude, that it was the retreat of a mere voluptuary. But

in whatever light his moral qualities may be considered, no one can withhold from him the character of an able politician.

It is not my intention to enter into a general or particular description of the Roman antiquities, which have been found in Switzerland; if you are curious in researches of that sort, I must refer you to Bochart, Miller, Spon, and other antiquarians, who have treated minutely of that subject. I cannot, however, avoid mentioning two lately-discovered Roman monuments, which are placed in the garden of Mr. Levade, near the church at Laufanne.

The first is an altar of white marble with red veins, and was found, in 1782, by some workmen in digging the foundations of a house in the town of Vevay. It is broken in a horizontal direction; and what remains is a foot and a half long and a foot high. The inscription, though not entire, proves it to be an altar erected by the twentieth legion to the god Silvanus.

DEO SILVANO
ESPER URSUL.
FICIO LEG. XX.
DIC

The second monument is a Roman mile-stone, which was discovered in a vineyard near Pauda, a few paces from the high road.

It bears the following inscription:

Imp.
Cæs T. Æ. Avg
Antonino
Pio. P M. Krib -
Cos. III. P. P.
Avent: M. P. T.

XXXVIII.

This

This inscription ascertains a fact long unknown to the Swiss antiquarians. Bochart, among others, expresses his surprise, that no inscription, bearing the name Antoninus Pius, who was so great a benefactor to the ancient Helvetians, has been as yet found in Switzerland. But this mile-stone, which was put up in the third consulship of that emperor, proves the existence of such an inscription; and is probably the prelude to the discovery of other monuments erected in his honor.

The road from Lausanne to Vevay, runs along the sides of the mountains, between continued ranges of vineyards. The industry of the Swiss is no where more observable than in these parts: the mountains in many places, though naturally consisting of a bare steep rock, are thickly covered with vines. The mould has been brought from other grounds, in order to create a soil, and is supported by rows of stones ranged in straight lines like walls.

But this mode of culture however advantageous, and even necessary to the natives, occasions a disagreeable uniformity in the face of the country. The vines also do not form a pleasing and picturesque appearance, like those of the Valte-line⁴, which are carried in beautiful festoons from tree to tree. The plants are low, and fastened to poles about four feet in height; and the high walls which enclose them, and border the road, frequently interrupt the view.

This district between Lausanne and Vevay is called *La Vaux*, and contains the two pleasant little towns of Lutry and Cully; as also the two

⁴ See vol. iii.

villages of St. Saphorin⁵ and Corsier: it is entirely hilly, rising abruptly from the lake. Above the vineyards, are rich meadows, and a continued forest.

Vevay, the ancient *Vibiscum*, is the principal town of the bailliage of that name: it is clean and well built, stands in a small plain at the foot of the mountains on the edge of the water, and is one of the few towns in the canton of Berne which carry on any trade. The borders of this part of the lake are much more contrasted, wild, and picturesque, than those about Geneva: the mountains of the Vallais and Savoy boldly project into the water, and form a semicircular chain that encloses the lake, except where they are divided by the Rhone; which flows into it a few leagues from Vevay⁶.

⁵ In the church of St. Saphorin, is an ancient Roman mile-stone, found near that village, with the following inscription:

TI. CLAUDIVS. DRVSI. F.
CAES. AVG. GERM.
PONT. MAX. TRIB. POT. VII.
IMP. XII. P. P. COS. IIII.
F A
XXXVII.

This inscription ascertains two circumstances, which have been frequently called in question; namely, that the banks of the lake of Geneva, which border this part of Switzerland, were comprised within a Roman province, even so early as the time of Claudius; and also, that *Aventicum* was the chief town of this part of Helvetia: for the mile-stones always referred to the capital town of the province in which they were placed. From St. Saphorin to *Avenches* is exactly 37,000 paces; which answer to the 37th mile-stone.

⁶ Before quitting Vevay, the lover of grand scenes, must mount on the steeple of the church, which stands on an

Vevay is distinguished as being the residence of Edmund Ludlow, the famous parliamentary general, whose name stands foremost among the few persons, who, in those times of misrule and confusion, uniformly acted with consistency and dignity. True to his republican principles, he no less violently opposed the daring usurpation of Cromwell, than the arbitrary measures of Charles the First; and could never be prevailed upon, either by threats or promises, to desert the cause, which he considered as the cause of justice and liberty.

Being excepted, as one of the king's judges, from the act of indemnity passed at the restoration of Charles the Second, he wandered, without any fixed place of residence, until he found an asylum from the base attempts of his enemies at Vevay, under the protection of Berne.

At the important period of the revolution, he returned to England, anxious to serve his country under our great deliverer; and William the Third, whose mind rose superior to the narrow prejudices of party, was no less desirous to employ a general of such approved experience and fidelity. But the king being addressed by the House of Commons to issue a proclamation for apprehending Ludlow, at the moment his majesty was going to employ him; he was accordingly compelled to quit England at this critical period, and again settled at Vevay. We may collect from

eminence, and thence overlook the town, the lake with the gloomy rocks of Meillerie, visit the churchyard overshadowed with old trees; and sitting on its wall, await the setting of the sun, in order to cast a parting look on this admirable landscape. RAMOND.

his general character and conduct, that if he had been permitted to serve his country, he would have successfully employed his great military talents against the assertors of bigotry and despotism; and with the same zeal, which he had displayed in opposing an arbitrary government, would have supported the new administration; when the enormous prerogatives of the crown, against which he had unsheathed his sword, were abolished by law; and the freedom of the subject was established on the basis of equal liberty under the authority of a limited monarch.

He died in 1693, in the sixty-fourth year of his age; and was interred in the church of Vevay. His monument is a plain grave-stone of black marble, containing a Latin inscription, which is printed in Addison's Travels. The house which he formerly inhabited stands near the gate leading to the Vallais, and the following motto is inscribed over the door, which is still preserved out of respect to his memory. *Omne solum forti patria est, quia patris.*

The Memoirs of Ludlow are written in a simple and perspicuous style; with the fidelity of a man who was actually engaged in the scenes which he describes, and with the spirit of a general zealous in the cause which he had espoused and defended. Perhaps his animated detail of the trial and execution of the Regicides is scarcely surpassed by any narrative in ancient or modern history.

Nature can scarcely form a position more delightful than that of Chatillard or Clarens. It stands, not far from Vevay, above the village of Clarens, on an eminence, whose gentle declivity slopes gradually towards the lake: it commands

a view of that majestic body of water, its fertile borders, and the bold rocks and alps of Savoy. The adjacent scenery consists of vineyards, fields of corn and pasture, and rich groves of oak, ash, and Spanish chestnut-trees. Although the situation and environs harmonize with the animated scenery in the *Eloise* of Rousseau, yet the castle by no means accords with the description in the same work. The traveller sees an oblong building with ancient towers and a penthouse roof; in the inside a large hall that looks like a prison; and the whole bears rather the antiquated appearance of a feudal mansion inhabited by some turbulent baron, than the residence of the elegant and impassioned Julie.

Opposite to Clarens, on the other shore of the lake, are the dark gloomy rocks of Meillerie. That village lies in the recess of a small bay, at the foot of impending mountains, in some parts gently sloping, and clothed to the water's edge with dark forests; in others naked and perpendicular, bringing to recollection the fancied rocks of Leucate⁷.

These are the scenes of the *Nouvelle Eloise*. Having obtained that novel at a circulating library in Lausanne, I continued, during these expeditions, to examine the position of the country, and compare it with the descriptions of Rousseau. Small objects may be magnified; but no pencil, however animated, can delineate the wonderful

⁷ Je n'ai plus qu'un mot à vous dire, ô Julie. Vous connaissez l'antique usage du *rocher de Leucate*, dernier refuge des amans malheureux. Ce lieu-ci lui ressemble à bien des égards. La roche est escarpée, l'eau est profonde, & je suis au desespoir.

and sublime works of nature; even the warm coloring of Rousseau has not equalled the beauty of the situations. I read with attention the principal parts of that singular performance; and having now the scenery before me, I dwelt more particularly upon that letter, in which St. Preux relates his expedition to Meillerie; wherein love and despair are worked up almost to madness. Open that performance, read that letter, and consider that part of it, where St. Preux points out the number of towns and villages, the continued fertility and high cultivation of the Pays de Vaud, and contrasts it with the gloomy coast of Chablais, exhibiting only a few towns lying on the edge of the water; you will then see the happy and superior effects of liberty under a mild and equitable government, like that of Berne.

I am, &c.

L E T T E R 43.

Castle of Chillon — Villeneuve — Aigle — Salt-Works of Bex and Aigle.

TRAVELLERS not unusually make an agreeable excursion from Vevay to the salt-works of Bex and Aigle.

The road continues along a plain, with hills on one side, and the lake on the other. Haller's judicious distinction of the elevated part of this country, may from this spot be well exemplified. The rocky alps are seen with their pyramidal tops

shooting into the heavens, and incruited with eternal ice and snow. Snow likewise, at various intervals, covers the steep slopes beneath the aspiring peaks; rich pasturage succeeds, and the bottoms are verdant with forests of firs. The mountains, such as the Jura and those rising toward Denis and Gruyeres, are fertile in grass, well wooded, their tops even, extensive and arable; and though with little appearance of rock on the surface, yet internally filled with a hard yellowish stone fit for building, but impatient of the chissel. The *collines*, or little hills, are frequent at the foot of the mountains, and separated by little vallies watered by small brooks.

The further I advanced, the nearer the mountains approached the lake; their nature changed, their height increased, and their craggy tops and wooded sides convinced me, that I was approaching the genuine alps. Above the woods soared, in a most picturesque manner, a lofty pyramidal crag called *Le Dent de Jamant*. The woods were firs mixed with oak. The road lay close to the water's edge. The castle of Chillon, or rather the castellated house, is a large pile with round and square towers: it stands on a rock in the lake, and is connected to the land by a draw-bridge. The vaults are very fine; the arched roofs, and the pillars which support it, are in a neat gothic style. This castle, in 1536, was wrested from Charles the Third of Savoy by the canton of Berne, assisted by the Genevans, who furnished a frigate (their naval force) to besiege it by water. In a deep dungeon, below the level of the lake, the conquerors found Bonivard, prior of St. Victor, the intrepid antagonist of the

dukes of Savoy, and the great assertor of Genevan independence. He had been imprisoned by the Savoyards during six years; and, by constant walking in his short limits, had worn a hollow in the rock. This castle was for a short time the residence of a bailif from Berne, until a more convenient house was purchased for that officer in Vevay. About half a league further is Villeneuve, a small town at the extremity of the lake. I travelled along the concave side of this magnificent piece of water from Geneva to Villeneuve fifty-four miles. It is in the shape of a crescent; Switzerland forms the hollow; Savoy the convex part; its greatest breadth is from St. Sulpice to Grande Rive, where it is twelve miles wide. Savoy affords a rude and awful boundary of aspiring alps, craggy and covered with the ice of ages. The country from Geneva to the environs of Lausanne, slopes for a considerable way to the margin of the lake, and is enriched with all the varieties which nature can bestow. The long ridge of the Jura, fertile in pasturage, and varied with woods, backs this beautiful tract. Near Lausanne the banks rise very considerably, and form a most charming terrace. A few miles beyond Lausanne is a rapid descent. Near Vevay begins a plain, which is continued far beyond the end of the lake, but contracting, by the approach of the mountains, towards the water. The color of the water is extremely beautiful, clear, and at a distance seems of a most lovely blue.

Near Geneva the coast abounds in small pebbles covered with a brown incrustation. From Geneva as far as Lausanne the shores are sandy; but from Lausanne to Chillon appear ledges of

rocks hard and calcareous: the extremity of the lake is a marsh formed by the collected mud of the Rhone.

The depth is various. Mr. de Luc asserts, that on sounding it he had found the greatest depth to be a hundred and sixty fathoms: like all inland lakes enclosed within high mountains, it is subject to sudden storms.

I am uncertain whether any birds frequent the lake which are not common to the rest of Switzerland. The tippet grebes^s appear here in December and retire in February. The skins are an elegant article of luxury, and sell for about twelve or fourteen shillings each. These birds are obliged to breed in other places, this lake being almost totally destitute of reeds and rushes, in which they form their floating nest. From Villeneuve the road runs through a beautiful valley, consisting of the richest meadow and corn land, very populous and finely wooded, and expanding to the breadth of four miles. The alps bound each side, with tops broken into vast crags of various forms.

I passed near La Roche, where a director of the salt-works is deputed by the government of Berne; and which is rendered memorable by the residence of Haller, who filled that office from 1758 to 1766. During his retirement in this place, that distinguished man prepared for public inspection many of his numerous publications, and particularly his immortal work on physiology.

I left at a little distance Yvorne, ruined, in 1584, by the lapse of a mountain occasioned by

^s Pennant's Brit. Zool. vol. ii. No. 222.

an earthquake; crossed the torrent called La Grande Eau, and halted at Aigle, a good town, seated at the feet of some small round hills prettily covered with firs. This country was conquered from the Savoyards by Berne in 1475, and was made a distinct government consisting of four *Mandemens*. The governor resides at Aigle. It formerly had its particular heads, the family of Torrens; but the last count formally resigned his pretensions at Berne in 1553. This government of Aigle reaches to the Pays de Vaud; and, when under the dominion of the house of Savoy, was comprised within that district; at present it is classed under the German division of that canton, although French is the language of the natives. Further on the valley is greatly contracted, and so filled with trees as to appear a great forest. The laburnum abounds here in a wild state. The wood is beautifully veined, of great strength, and much used for wedges and musical instruments. The variety with short spikes of flowers has the most elegant veins, and is called the *ebony* of the Alps: Pliny says its wood is the hardest next to the ebony. The cornelian cherry is common in the hedges, and the fruit is frequently preserved with sugar. The *Machaleb* cherry, or *Prunus Machaleb*, is to be found in these parts; the wood is red, of fine scent, in request for handles of knives, it is known among cutlers by the name of *Bois de St. Lucie*. A pleasant-scented water is distilled from this tree; and the seeds are used to give a fragrancy to soap.

Between Aigle and Bex is a most picturesque view of the castle of St. Tryphon, on the summit of a lofty insulated rock in the middle of the

plain; it is quite surrounded with wood, and realizes Milton's description of an ancient castle,

"Bosom'd high in tufted trees."

I am informed it is built of marble, which is no wonder, as a beautiful black species is found very near. St. Tryphon was a Phrygian, who is said to have suffered martyrdom at Nice in 251, at the time of the persecution under the emperor Decius.

Bex is a small town at the foot of the mountains, five miles from the salt-works at Bevioux. Between Bex and Bevioux, I observed the larch in great plenty. Painters, from the time of Pliny to that of Raphael, trusted their works to this wood, which the Roman naturalist styles *immortale lignum*. The wood is reckoned excellent for all works which are to lie under water; and the borderers on the lake of Geneva prefer it for building their vessels. In these parts I saw most beautiful woods of chestnut. Haller says that they extend some leagues; he also informs us, that they are found in other parts of Switzerland, and even in desert places in some of the transalpine parts; accident must have brought them thither, as it appears from Pliny, that these trees were first introduced into Europe from Sardis.

Upon our arrival at the salt-springs, I put on a workman's jacket, and went into the mountain about 3,000 feet, almost horizontally. The gallery is about six feet high, and four broad, and is as nicely hollowed as if it had been cut with a chisel: it is hewn in a black rock, veined in some places with white gypsum. The salt is produced from

some springs, which are found within a solid rock, perforated at a great expense: the richest source yields twenty-eight pound of salt *per cent.* and the poorest but half a pound in the same quantity. Near these springs are several warm sources, strongly impregnated with sulphur; some of which contain also a mixture of salt, and will flame if a lighted candle is put into the pipe through which they flow. No solid salt, excepting a few small cubes, has been yet discovered; but the mountain is replete with particles. Rocks of white gypsum or alabaster, mixed with bluish clay, are common near the springs, in the same manner as may be observed in the pits of Northwich, in Cheshire.

After travelling in this subterraneous passage near three quarters of a mile, I observed a great wheel of thirty-five feet diameter, which serves to raise the brine from the depth of about seventy feet. From this place is a shaft three hundred feet high, which is cut through the mountain to the surface, for the purpose of introducing fresh air. I noticed two reservoirs hollowed in the solid rock for holding the brine; one whereof was a hundred and sixty feet square, and nine in depth. Since my first expedition to these pits in 1776, the workmen had pierced the rock twenty-five feet deeper, and cut a gallery a hundred feet in length. They had also begun to form a third reservoir, which is to contain 5,500 cubic feet; and of this nearly half was finished.

The brine deposited in these reservoirs is conveyed, by means of two thousand pipes, about a league to Bevioux, where the salt is extracted.

The brine pits near Aigle contain only from two to one-half *per cent.*; and yield annually about a third as much as those of Bevieux, or about 5,000 quintals. The salt is much whiter and heavier than that of Bevieux, and consequently bears a higher price.

These salt-works, which are the only ones in Switzerland, scarcely yield a neat yearly profit of more than L. 3,000; and furnish only one-twelfth of the annual consumption in the canton. The remainder is procured chiefly from France, which is obliged by treaty to provide the Swiss states with this commodity at a moderate price: and indeed so high is the tax upon salt in that kingdom, that even the French salt is sold two-thirds cheaper in Switzerland, than in many parts of France⁹. The ordinary price of common salt throughout the canton, is at the rate of three-half-pence per pound.

Description of the Inside of the Saltworks at Bex, by the Translator.

Two leagues from Bex, in the centre of a narrow pass, rises a hill, on whose sides appear several airholes, communicating with as many drifts by which it is perforated; the adit lies towards the South, in a wild and picturesque vale.

This avenue is six feet high, and four broad; built and vaulted under the earth, and supported by timberwork where the side-stones are loose; it traverses at first a solid calcareous

⁹ At Paris, where it is the dearest, a pound of salt is sold for about 13 sols, or about six-pence of our money: in some other parts of France, for instance in Franche Comté, a pound costs only 4 or 5 sols; but it is furnished to the Swiss at the rate of 2 $\frac{1}{2}$ sols.

rock, then some strata of gypsum. Some of the drifts follow an oblique direction, but the principal burrow proceeds in a straight line, from South to North. The water soaks in great abundance through the rock, and is discharged by the different canals of the drifts into a pit seventy-five feet deep, which is always full of brine, yielding about twelve per cent of salt. On the side of this pit, but a little higher, there is a reservoir for the reception of the sulphureous water, which would infect the salt springs. This water contains but one per cent of salt. Behind these two receptacles there rise laterally two flights of stairs, by which, after having mounted about twenty steps, and descended six or seven, we arrived at a spacious lake of saltwater, placed in an artificial and regular basin, one hundred feet long, fifty-three feet broad, and nine feet high. The roof over this basin is not vaulted, but cut horizontally, and without any prop or support. Two persons placed on these opposite stairs may hear their voices considerably raised. Our guide went to entertain us by singing a mournful ditty, very proper for the place, which reverberated the sound in a very frightful manner; and whose gloom was heightened by our dresses, and the dim light reflected from the lamps which we held in our hands.

Behind this lake is the place, where the miners, who, to drive their burrow, had set off from opposite points, met in a straight line.

At last we arrived at the *Grande Chartre*, or the principal pit, dug in the centre of the mountain, under a kind of artificial dome, at a distance of about three thousand feet from the entrance. Into this pit they descend by three very long ladders. Above there is a wheel of thirty six feet diameter, which moves the pumps by which the water is incessantly drawn out of this receptacle. Through this roof they have cut a chimney, which pierces the mountain perpendicularly; it is about four hundred feet high, and one may go up through it by thirty ladders, that are fastened on

its sides. Through this aperture one may see the stars at noon.

Beyond this pit they have lately cut two drifts which are now about twelve hundred feet long. Here we saw the miners at work. In each of these drifts but one man can work at a time. The heat of the lamp, together with that of the workman becomes in this narrow space so intense, that it would in a short time prove mortal to him, did he not continually receive, through pipes, a constant supply of fresh air from without; it is surprising how speedily this air is consumed and dissolved by the fire of the lamp, and the lungs of the workman. These miners work but six hours a day at the end of which they are relieved. During their stay underground they are obliged to cut an inch or an inch and a half, according to the hardness of the rock.

At some distance from this mine, and nearer to Bex, is that of *Bouillet*, which the miners were forced to abandon; because in pursuing their work they opened a vein of fresh water that drowned the brine pits, which before this accident yielded twenty-eight per cent. The pit of this mine descends eight hundred feet below the drifts. The workmen in the great mine are now driving shafts in order to meet the salt rock of this, and are in hopes of uniting the two *chartres*.

Near these mines, on two hills separated by a stream, are two buildings, wherein the water is evaporated by dripping through faggots; and at the foot of these hills stand the boiling-houses.

This ingenious process advances the evaporation of the superfluous water, but does not separate the salt from the selenitous and earthy particles that alter it. Such a coarse strainer will not stop salts that are so much divided that they would go through the closest filter, with the fossil salt with which they are united by the same dissolvant; and the crust which forms on the surface of the faggot is less a precipitate, than a hasty and tumultuous crystallization, differing from

that of the boilers but by presenting very confusedly the small cubes of fossile salt, and the irregular crysials of salt with an earthy base.

The famous *Haller* has been for a considerable time governor of *Aigle*, and director of these mines; to him his countrymen are beholden for the enlightened activity and the economical intelligence with which they are worked.

LETTER 44.

Valley and Lake of Joux—Orbe—St. Barthelemi—Yverdun.

Yverdun, Sept. 7.

THE chain of mountains called the *Jura*, begins in the canton of Zurich, extends along the Rhine, into the canton and bishopric of Basle, stretches into the canton of Soleure and the principality of Neufchatel, branches out towards the Pays de Vaud, separates that country from Franche Comté and Burgundy, and continues beyond the frontiers of the Genevois as far as the Rhone. In various parts of the Pays de Vaud this chain forms many elevated vallies much visited by travellers, amongst which, not the least remarkable, is the valley of the lake of Joux, upon the top of that part of the Jura called Mont Joux¹; and which lies in the bailliage of Roman Motier. This valley contains several neat and well-peopled villages, and is beautifully checkered with wood, arable, and pasture ground. It is

¹ Mons Jovis, RAMOND.

watered

watered by two picturesque lakes; the largest of which is called the lake of Joux. One shore is high rock, covered with wood; the opposite banks form a gentle ascent, well cultivated and producing grain, backed by an abrupt ridge adorned with pines, beech, and oak. The smaller lake, Lac Brenet, is in its shape more oval, and richly bordered with corn-fields and cottages. These two lakes are divided by a narrow neck of land; and over the channel or little strait is a wooden bridge of a single arch, which leads to the village of Charbonniers.

Near the small village of Abbaye, a rivulet gushes from the bottom of the rock, and loses itself in the largest lake. From the smaller lake descends a stream, which is lost in a hollow gulph called *L'Entonnoir*, or the Funnel, a name common to several others in this place. In this gulph several mills are placed, and turned by the force of the current. About two miles further, on the other side of the mountain, the river Orbe bursts forth, and is probably produced by the last-mentioned stream here ingulphed.

This little vale is very populous, containing about three thousand inhabitants, who are remarkably industrious. Some make watches, but the greatest part are employed in polishing crystals, granites, and marcasites. In the small village of Pont, where we lodged, the greatest part of the inhabitants bear the surname of Rochat; a name which also runs through the village of Charbonniers, with the exception of only two or three families; and is prevalent likewise in that of Abbaye: the whole number of these Rochats amounts to above a thousand. I inquired whether, like the

Scottish clans, they took the appellation from any chief; or whether they were supposed to be descendants of the same family: I was assured, that the latter is the fact, and that their ancestors came originally from France. These parts are much infested with bears and wolves.

In our ascent to this delightful vale, and as we descended through a variety of hill, valley, wood, and lawn; we had a most extensive prospect, comprehending great part of the Pays de Vaud, the lake of Geneva with its mountainous boundary, and that of Neufchatel. These two lakes appear, from that high point of view, to be nearly upon the same level³, with no considerable swell of the country intervening.

We passed through a beautiful and picturesque country from Romain Motier to Orbe; which, according to antiquarians, was the most ancient town, and once the most powerful, of all Helvetia. It was called *Urba*, and was the capital of the *Pagus Urbigenus*: no remains however exist at present of its ancient splendor. Some antique fortifications, an old castle, and a round tower, are works probably of later and more turbulent times; erected, perhaps, when this country was divided into a number of feudal sovereignties.

I am greatly pleased with the romantic situation of Orbe, the boldness of the single-arched bridge projecting over the Orbe, the wild scenery on the banks of that river, its frequent cataracts, and with various picturesque views in the environs.

³ According to Mr. de Luc, the lake of Neufchatel is 159 French feet above that of Geneva.

Mr. Venel, an eniment surgeon of this town, has formed, under the protection of the government of Berne, an establishment which well deserves the attention of the humane and curious traveller. It is an infirmary for the reception of those objects, who are born with distorted limbs, or have by accident acquired that misfortune.

The children are lodged and boarded in the house, under the care of his assistant, who charges himself with all the detail of house-keeping, and of instructing those, whose age renders it requisite, that their education should not be neglected.

Mr. Venel's skill in improving and simplifying those machines necessary for his purpose, has been sufficiently attested by various cures.

Though he chiefly confines his attempts to infants and children, yet he has performed several cures on adult persons. His most efficacious remedy is a machine which he has invented to embrace the patient's limbs when in bed, and which is so contrived as to act without disturbing their rest. Ingenious as his method is, yet he acknowledges, that much of his success depends on the mild treatment of the patients, and on having them continually under his inspection. I was convinced indeed of the mildness of his treatment, by observing several of these children, from four to ten years of age, crawling about the ground, and diverting themselves with great cheerfulness, although cased up in their machinery. It may not perhaps be unworthy of remark, that Mr. Venel, on the admission of a miserable object, takes in plaister of Paris the mould of the

distorted limbs, in order to demonstrate the change that takes place. Such an establishment redounds highly to the honor of Mr. Venel, and the government who protects it, and is worthy of imitation in all countries.

Orbe, which is governed by its own magistrates, is comprised within the bailliage of Echalens, belonging to Berne and Friburgh: these two cantons alternately send a bailif, who resides at Echalens, and remains in office during five years. When Berne appoints the bailif, an appeal lies from his decisions to the sovereign council of Friburgh; as it does to the government of Berne, when he is nominated by Friburgh. By these means a great check is laid upon the exactions of the bailif: and I am informed, that justice is nowhere more equally administered than in these common bailliages of the two cantons.

Perhaps one of the most beautiful and finest positions in Switzerland is the castle of St. Barthelemi, the seat of Count d'Affry, colonel of the Swiss guards; and now inhabited by his son, count Louis d'Affry, to whom I was indebted for a most kind and friendly reception. This ancient family-seat stands on an eminence in the bailliage of Echalens, about three miles from Orbe, near the high road which leads from Lausanne to Yverdun. The sides of the eminence are feathered with wood; and below are rich fields and meadows of the finest verdure, watered by two lively torrents which unite and form the Falun. Upon the high road, the count has reared an obelisk, on which he has inscribed, in the true spirit of toleration and forbearance, the following words, "*Praise God, all ye*

nation," in the English, Latin, French, and German languages.

The castle commands a prospect of a most fertile and well-wooded country, gently broken into hill and dale; on one side appears a distant view of the Jura and the hills of Burgundy and Franche Comté; and, on the other, the horizon is bounded by the rugged alps in the canton of Berne and in the Vallais, by Mount Velain, the highest point of St. Bernard and Mont Blanc, whose superior elevation above the surrounding heights is such, that its summit reflects the rays of the rising sun several minutes sooner, and retains those of the setting sun several minutes later than any of the circumjacent mountains.

From St. Barthelemi we descended into the plain, which stretches to the lake of Yverdun. This plain was formerly covered as far as Entrenches (three leagues from its present position) and probably further, by that lake: it is now, for a considerable part, a great swamp. Within a quarter of a mile of the town, are warm baths which are strongly sulphureous, and much frequented during the summer months.

Yverdun is large, airy, and well-built with stone, like the towns in the Pays de Vaud: it stands near the lake, in a small island formed by the two branches of the river Thiele. Between the town and the lake there is a pleasant lawn extending to the water, and planted with avenues of lime-trees.

Yverdun carries on scarcely any trade, and its principal support arises from the passage of the merchandise between Piedmont and Germany. This town is celebrated for its printing-press,

established in the beginning of the present century; but entirely neglected until, some years ago, it was renewed by *Felice*, a Neapolitan of learning and abilities.

The lake of Yverdun, or of Neufchatel, stretches from south to north about twenty miles in length, and in some places about five in breadth. Its shores near Yverdun are covered with country-houses.

It is somewhat extraordinary, that the dull and tasteless uniformity of the French gardens should have been adopted by the Swiss, whose country abounds with noble and picturesque situations, and where nature wantons in the most luxuriant variety. I have frequently observed, in the midst of these romantic scenes, a majestic forest sliced into regular alleys; and at the very borders of the fine lakes, artificial pools of water edged with sun-burnt parterres.

If any person should, in this instance, accuse me of national prejudice, let me exclaim with Voltaire, who certainly cannot be convicted of partiality to the English:

*Jardins plantés en symétrie,
Arbres nains tirés du cordeau,
Celui qui vous mit au niveau
En vain s'applaudit, se récrie;
En voyant ce petit morceau,
Jardins il faut que je vous fuie,
Trop d'art me révolte & m'ennuie:
J'aime mieux ces vastes forêts;
La nature libre & hardie
Irregulière dans ses traits
S'accorde avec ma fantaisie.*

I am, &c.

L E T T E R 45.

Granfon—Neufchatel—Mr. Pury's Benefactions,

WE skirted the west side of the lake of Neufchatel through Granfon, the principal town of a bailliage of that name, belonging to Berne and Friburgh, and remarkable for the battle in which Charles the Bold, duke of Burgundy, was defeated by the Swifs in 1476. We entered the principality of Neufchatel about fix miles from that town, and passed through St. Aubin, Boudri, Colombier, lying pleasantly upon the borders of the water. The road runs along the side of the Jura, through a country that resembled, in some measure, the district of La Vaux, between Lausanne and Vevay: the sides of the Jura are almost the whole way covered with vines, supported in many parts by low stone-walls. The borders of this lake are more uniform than those of the lake of Geneva; and do not rise into such high, irregular, and grotesque alps as the coast of Chablais. Towards Granfon and St. Aubin, the country is more diversified with meadows and corn-fields; nearer to Neufchatel, the summits of the mountains are clothed with forest, and the midland and lower parts entirely planted with vines.

Between the lake and the Jura several rivers burst from the rock in considerable streams; and, after turning several mills, fall into the lake at a little distance from their source. The largest is that of La Serriere, near a small village of the same name, which we crossed in our way to Colombier, where we dined with a family whose

acquaintance we had formed at the baths of Leuk. We passed a very agreeable day with these amiable persons; by whom we were received with that frankness and unaffected ease which characterizes true politeness.

After dinner some musicians of the country performed the *Renz de vaches*: that famous air which was forbidden to be played among the Swiss troops in the French service; as it awakened in the soldiers such a longing recollection of their native country, that it often produced in them a settled melancholy, and occasioned frequent desertion. The French call this species of patriotic regret, *la maladie du pays*. There is nothing peculiarly striking in the tune; but, as it is composed of the most simple notes, the powerful effect of its melody upon the Swiss soldiers, in a foreign land, is the less surprising. Nothing indeed revives so lively a remembrance of former scenes, as a piece of favorite music which we were accustomed to hear amid our earliest and dearest connexions: upon such an occasion, a long train of associated ideas will necessarily arise in the mind, and, if not totally selfish, melt it into tenderness. To use the language of poetry,

There is in souls a sympathy with sounds.

Wherever I have heard

A kindred melody, the scene recurs,

*And with it all its pleasures and its pains*⁴.

It is observable, that those who inhabit mountainous countries are most subject to this *maladie du pays*, because their habits of life are essentially

⁴ Cowper's Task, book vi.

different from the customs and manners of other parts. Accordingly, the Scotch highlanders, and the Biscayans, as well as the Swifs, when absent from their country, are peculiarly apt to be affected with every circumstance that recalls it to their minds.

The town of Neufchatel is small, and contains about 3,000 souls. It lies partly upon the little plain between the lake and the Jura, and partly upon the declivity of that mountain: in consequence of which situation, some of its streets are very steep. At the commencement of the present century, commerce was almost wholly unknown in this town; as the ridiculous pride of its being deemed degrading, generally prevailed among the inhabitants. This senseless prejudice is now, however, nearly extinguished. The chief article of exportation is wine, produced from the neighbouring vineyards, and much esteemed. Manufactures also of printed linens and cottons have been established with success: and within these few years, several merchants have raised large fortunes.

P O S T C R I P T.

Oct. 3, 1786.

THE mildness of the government, and the general well-being of the inhabitants, are visibly demonstrated from the increase of population among the natives, and the prodigious influx of settlers. The number of souls in the principality of Neufchatel and Vallengin being, in 1752, only 28,017 subjects, and 4,318 aliens, amounted, in 1784, to 31,576 subjects, and 9,704 aliens, which

gives an increase of near a fourth part within the space of thirty-two years.

The facility of acquiring the burghership of Neufchatel, has also prevented any decrease of its inhabitants. Thus the magistrates, between the years 1760 and 1770, admitted forty-one burghers; from 1770 to 1780, forty-six; from 1780 to 1785, fifty-one; in all, a hundred and thirty-eight. Many of these settlers had children before they purchased the burghership; and thirty-eight were foreigners, either German, French, or Swiss.

Several public works and buildings have been lately executed at Neufchatel, at an expence far exceeding the revenues, or even wants of this little state. Amongst others I shall mention a superb causeway leading towards the valley of St. Imier, and a town-house, which is built of such solid materials, as if it was intended to survive to the most distant posterity, and to rival the duration of the much-famed Roman capitol⁵.

The person, to whom the burghers of Neufchatel principally owe the embellishment of their town, is Mr. David Pury, late banker of the court at Lisbon. He was a citizen of Neufchatel, and was born in 1709: his father was mayor of Lignieres, afterwards colonel and justice of peace in South Carolina, and founder of Purisburgh. Having received his education in his native town, he quitted it, as some say, in great poverty, and repaired to Geneva, where he passed his apprenticeship, but in what house, or in what trade, the person, who obligingly furnished me with these anecdotes, does not mention. From Geneva he

⁵ *Capitoli IMMOBILE saxum.* Virgil.

went to London, and acted as one of the clerks to an eminent jeweller, where he acquired a great skill for estimating at sight the value of diamonds. After a long residence in England, he established himself in Lisbon, and carried on a very extensive commerce, particularly in brazil-wood and precious stones. Being appointed court-banker, he rapidly increased his fortune. This generous man, however, did not, with a parsimony not unusual in persons who have enriched themselves by commerce, consign his money to his coffers, or sparingly distribute his largesses; on the contrary, while living, he remitted large sums of money to his native town; and being unmarried, and having none but distant relations, left his country his heir. The following is a list of the sums which he gave away, either in charitable donations, or for the improvement of Neufchatel.

From the year 1771 to 1786, L. 100 annually for the poor of Neufchatel, and the same sum for those of Vallengin, which, for fifteen years, amounts to L. 3,000. Different sums at various periods, and for divers uses, to January 1785, amounting to L. 15,900. To this must be added the purchase of near 7,000 tickets in the lottery towards raising a fund for building and endowing an hospital; which tickets he also presented to the said hospital. He died on the 31st of May 1785; and the remains of his fortune, bequeathed to his country, after the payment of a few legacies, does not fall short of L. 160,000, which, together with the contributions in his life-time, render his benefactions equal to almost L. 200,000.

His grateful country obtained from the king of Prussia the title of baron in his favor; a title which, through his singular modesty, he neither bore nor used in the signature of his letters. The citizens of Neufchatel have also placed the portrait of this generous benefactor in one of the apartments in which government assemble; and have ordered a marble bust to be executed for the new town-house.

The large legacy which Pury has bequeathed to the town, being more than sufficient to complete the buildings and public works, it would well become the wisdom of government to employ part of the remainder, rather in useful undertakings, than in the construction of new edifices, which are not wanted. With respect to those works, which regard the health and convenience of the town, it may be sufficient to hint, that the public walks, which are now much neglected, might be improved; the streets, which are extremely dirty, be cleansed; and the torrent, which traverses the town and threatens it with frequent inundations, may be turned. But particularly a large field is open for the protection and encouragement of literature; for even in the essential article of education this place is so deficient, that it can scarcely be said to possess a single seminary; consequently the inhabitants, though endowed with lively parts and good capacities, are yet much less informed than those of the other Protestant towns in Switzerland. A new spirit may be given to the study of the arts and sciences; and the seminary may be rendered of great public utility by appointing two or three professors for the instruction of youth. Thus future

generations, enlightened by means of this benefaction, will repeat with satisfaction the name of Pury; joining in their grateful commemorations those magistrates, who first opened the sources of science and literature, and taught them to flow for the improvement of a distant posterity.

L E T T E R 46.

Expedition to Locle and Chaux de Fond.

Neufchatel, Sept. 11.

I AM charmed with an expedition to the summit of the Jura; and will give you a short account of it, while the impression remains warm upon my mind.

The principality of Neufchatel and Vallengin, stretches from the lake to the limits of Franche Comté; containing in length, from north to south, about twelve leagues, and about six in its greatest breadth. The district of Neufchatel occupies all the plain, together with the lower parts of the mountains: while Vallengin is totally enclosed within the Jura. Parallel chains of the Jura run from east to west, and form, in the most elevated parts, several valleys. The lower grounds of this chain are arable lands and vineyards: the higher consist of large tracts of forest, which in many parts have been cleared, and converted into considerable pastures, intermixed with some fields of barley and oats. But the singular genius and industry of the numerous inhabitants,

particularly demands the attention of every curious traveller.

We passed through *Vallengin*, the capital of the district of that name; a small open burgh, with a modern castle built on some ancient ruins. We then crossed the *Val de Ruz*, which contains above twenty villages, situated at the foot of the mountains which border the valley: the inhabitants in general are employed in agriculture, some few excepted, who follow occasionally the mechanical arts.

We arrived about mid-day at *La Chaux de Fond*, a large handsome village lying in a broad valley which reaches to *Franche Comté*: from thence we proceeded to *Locle*, through a continued range of pleasing cottages, which skirt both sides of the road; and are scattered likewise over the country. As these two little towns or villages carry on the same commerce; I shall comprehend them both under one common description.

La Chaux de Fond and *Locle*, together with the districts belonging to them, may contain about six thousand inhabitants, remarkably distinguished for their genius, industry, and skill in the mechanical arts. They carry on an extensive commerce in lace, stockings, cutlery, and other merchandise of their own manufacture: but watch-making, and every branch of clock-work, are the articles in which they particularly excel. They not only make every utensil employed in those arts, but have invented several: and all sorts of workmen necessary for the completion of that branch of business, such as painters, enamellers, engravers, and gilders, are found in these villages;

where, upon an average, about forty thousand watches are yearly made. The genius and industry, indeed, observable upon these mountains, exhibit a scene uncommonly pleasing. As every individual is sure, not only of obtaining a comfortable maintenance for himself, but also of soon placing his children in a way of procuring their own livelihood; the people marry very early.

Not many years ago, the greatest part of these valleys was almost one continued forest; but the wonder-working powers of industry have happily changed the scene into flourishing villages and fertile pastures. The increase of population will appear from the following fact: Formerly the produce of the country was more than sufficient for the consumption of the inhabitants; at present, although, considerably more cultivated, it scarcely furnishes an eighth part of the provisions necessary for interior consumption: the remainder is drawn from Franche Comté. And no wonder; for beside the natural effect of their frequent and early marriages; every stranger, who brings a certificate of his good behaviour, is at liberty to settle, and to follow any trade without the least restriction. Here, no apprenticeship is necessary; nothing is contraband; and industry exerts herself untaxed.

Beside those particular arts I have already mentioned, several inhabitants of Locle and La Chaux de Fond are well skilled in other branches of mechanical science, and have invented useful mathematical and astronomical instruments. Among those who have eminently distinguished themselves in this way, is the famous Jaquet Droz, who is now at Paris; and whose son exhibited in England several automatical figures of a very singular and

surprising construction: one played upon the harpsichord; another drew landscapes, and, what is still more extraordinary, a third copied any word presented to it, or wrote down whatever was dictated by any of the company. These are certainly wonderful inventions, and seem to exalt the powers of mechanism; but still they are mere toys, and an unworthy waste of great genius: it is Swift making riddles. How much more laudably, and with equal success, might the same talents and application have been exerted in improving, or adding to, those instruments and apparatus which are necessary to the astronomer and natural philosopher!

The origin of watch-making in these parts, as related by Mr. Osterwald, the historiographer of these mountains, is extremely curious; and the truth of his account was confirmed to me by several artists both of Locle and La Chaux de Fond. In 1679, one of the inhabitants brought from London a watch; which being out of order, he intrusted it to Daniel John Richard, of La Sagne. Richard, after examining the mechanism with great attention, determined to attempt making a watch from the model before him: but to this end he was destitute of every other assistance than the powers of his own native genius. Accordingly he employed a whole year in inventing and finishing the several instruments previously necessary for his purpose; and in six months from that period (by the sole force of his own penetrating and persevering talents) he produced a complete watch. But his ambition and industry did not stop here: beside applying himself successfully to the invention of several new instruments
useful

useful for the perfection of his work, he took a journey to Geneva, where he gained considerable information in the art. He continued for some time the only watchmaker in these parts; but business increasing, he instructed several associates; by whose assistance he was enabled to supply from his single shop all the demands of the neighbouring country. Towards the beginning of the present century he removed to Locle, where he died in 1741, leaving five sons, who followed their father's occupation. The knowledge and practice of the art gradually spread itself, is now become almost the universal business of the inhabitants, and may be deemed the principal cause of the population observable in these mountains.

The inventive genius of this mechanical people is not merely observable in the above-mentioned articles, but discovers itself upon all occasions where it can be applied to the purposes of their convenience and accommodations. To give an instance: the rocks in most parts of the alps being exceedingly hard and solid, the waters usually make their way along their sides, and rush down in perpetual torrents: but the strata which compose the Jura being less firm and compact; the rains and melted snow penetrating into the crevices, form subterraneous channels, and issue in rivulets at the bottom of the mountains. Now the peasants, in order to avail themselves of this peculiarity, have, in the midst of these subterraneous channels, and with much labor, erected mills, which are turned by the descending torrents. For this purpose the builders have constructed wheels in places where it seemed scarcely practicable: have invented new modes of scaffolding,

and a great variety of other ingenious contrivances in order to facilitate their work.

The natives of these districts are exceedingly courteous to strangers who visit their country. They are in general very well informed in several branches of knowledge; and as they usually employ their leisure hours in reading, many of the villages contain circulating libraries.

The houses are plaistered and whitewashed; though small, are commodious and well-built; and furnished with a degree of neatness, and even elegance, peculiarly striking in these sequestered mountains.

The rock which forms the base of the Jura, is mostly composed of calcareous stone; and perhaps there is no spot in Europe where are found so large a quantity of petrified shells and marine plants in so small a space. Near Locle I observed a ridge of hills, that seemed to consist entirely of *pierres arborisées*, or stones bearing the impression of plants.

In returning, we had a most sublime prospect of the lakes of Neufchatel, Bienne, and Morat, with the high and rugged chain of alps stretching from the cantons of Berne and Friburgh, as far as the Vallais, and the mountains of Chablais.

Such perfect ease and plenty reigns throughout these mountains, that I scarcely saw one object of poverty: the natural effects of industry under a mild and equitable government. It is of these vallies and of their inhabitants, that Rousseau gives so enchanting a description in his letter to D'Alembert.

I am, &c.

L E T T E R 47.

Government of Neufchatel.

BY the death of the duchess of Nemours, in 1707, the sovereignty of Neufchatel and Vallengin became vacant; and being claimed by Frederic the First, king of Prussia, as heir to the prince of Orange, his right was acknowledged by the states of the country. Upon his death it descended to his son Frederic William, who transmitted it with his other dominions to Frederic the Second.

The constitution of Neufchatel is a limited monarchy. The machine of this government is indeed actuated by such nice springs, and its wheels are so exceedingly complicated, that it is very difficult for a stranger to distinguish, with any degree of accuracy, the prerogatives of the sovereign, and the franchises of the people: particularly as some, even of their most important privileges, depend upon mutual acquiescence and immemorial custom, and not upon written laws. I shall endeavour, however, to trace the principal features of this government; the result of my best inquiries during my continuance at Neufchatel.

Upon the accession of Frederic the First, certain general articles, which in a great measure established the prerogatives of the prince, and the liberties of the subject, were signed and ratified by the king. Beside these general articles, which his present majesty upon his accession promised to preserve inviolate; others were added at the pacification of 1768, which finished the dispute between the sovereign and subject. By

this pacification, the king not only renewed his assent to the *general* articles; but also explained them, wherever their tenor had been mistaken; expressly confirming also several other privileges in favor of the people, which had hitherto been equivocal, or not duly observed.

The most important of these general articles are:

1. The sovereign promises to maintain the Reformed religion as by law established; and to tolerate no other sect, except within the districts of Landeron and Cressier, where the catholic religion is dominant.

2. No person but a native of the country is capable of holding any civil or military charge, excepting that of governor, who may be a foreigner; and the same incapacity is extended even to natives, who are in the service of a foreign prince.

3. All the subjects have a right to enter into the service of a foreign power; provided that power is not in actual war against the prince, as sovereign of Neufchatel: and if the sovereign should be engaged in hostilities, which do not concern Neufchatel, that state may continue neutral, except the Helvetic body should be involved in the contest⁶.

⁶ The latter clause of this article is not so clearly worded as it might have been; from a delicacy, I suppose, of not expressly stipulating, that the states of Neufchatel and Vallengin may oppose their sovereign by arms, in case the Swiss should be engaged in any war against him. It is evident, however, that they consider their connexion with the Helvetic body, as of superior obligation to that with their prince, as sovereign of Neufchatel and Vallengin.

4. Justice shall be equitably administered: and, for this purpose, the three estates of Neufchatel and Vallengin shall be annually assembled.

5. The magistrates and officers of justice, instead of holding their employments during pleasure, shall enjoy them during their good behaviour. And, by the late pacification, it was further agreed, that the prince is not himself the judge of their good behaviour; but that in order to be deprived of their places, they must be fully convicted of malversation in office, by certain judges at Neufchatel appointed for that purpose.

6. The sovereign shall take the accustomed oath upon his accession; and promise to maintain all the rights, liberties, franchises, and customs, written or unwritten.

It is remarkable, that one of the most essential rights of the subject, depends upon immemorial usage; for, that “the sovereign shall be considered as resident only at Neufchatel,” is in the number of their unwritten immunities. Now this privilege, in conjunction with the third article just cited, forms the basis of their civil liberty.

The remarkable clause in question is as follows:

Et qu'en outre & conformément à des articles exprès & formels des franchises tant de la bourgeoisie de Neufchatel que de celle de Vallengin, cet Etat ne puisse être engagé dans aucune guerre, ni les sujets d'icelui obligés d'y marcher, que ce ne soit pour la propre guerre du Prince, c'est-à-dire, pour la défense de l'Etat, & pour les guerres que le Prince pourroit avoir en tant que souverain de Neufchatel & non autrement: en sorte que s'il avoit guerre pour raison de quelque autre Etat, terres & seigneuries, l'Etat de Neufchatel ne soit point obligé d'y entrer; mais en ce cas devra demeurer dans la neutralité, à moins que tout le corps Helvétique en général n'y prit part & intérêt.

By the former, the prince, when absent, can only address his subjects through his governor and the council of state; and no subject can be tried out of the country, or otherwise than by judges appointed by the constitution: by the latter, should the king of Prussia be at war with all Germany; the people of Neufchatel and Vallengin are by no means obliged to arm in his defence; but individuals may even serve against him, so long as the powers whom they serve, are not engaged in hostilities against their country⁷.

Beside these general articles, that comprehend the privileges of the people at large; there are others which the sovereign is equally bound to maintain, relating to the town of Neufchatel and the district of Vallengin, in particular.

The prince confers nobility, nominates to the principal offices of state, both civil and military, and appoints the chatelains and mayors, who preside in the courts of justice. His revenues, which are very moderate, and scarcely amount to *L.* 5,000 a year, arise from certain demesnes; from a small land tax; from the tithes of wine and corn; and from the tenth of the value on the sale of immoveables. With regard to commerce, no subject pays any duties either of importation or exportation, except for foreign wines imported into the town of Neufchatel.

During the absence of the prince, he is represented by a governor of his own appointing; who

⁷ When Henry duke of Longueville, and sovereign of Neufchatel, was, in 1650, sent to the castle of Vincennes, Felix de Mareval, captain of the Swiss guards, kept guard in his turn, though he was a citizen of Neufchatel, at the door of the prison, in which his sovereign was confined.

enjoys considerable honors, but is extremely limited in his authority. He convokes the three estates, presides in that assembly, and has the casting vote if the suffrages happen to be equal: he enjoys the power also, in criminal cases, of pardoning, or of mitigating the sentence. In the governor's absence his place is supplied by the senior counsellor of state.

The three estates of Neufchatel, form the superior tribunal of this country, and receive appeals from the inferior courts of justice. They are composed of twelve judges, divided into three estates: the first consists of the four senior counsellors of state, who are noble; the second, of the four chatelains of Landeron, Boudry, Val de Travers, and Thielle⁸; and in case of absence, their place is supplied by the respective mayors in the principality of Neufchatel, according to a regulated order; the third is composed of four counsellors of the town of Neufchatel. The judges in the first and second division hold their places for life; those in the third are appointed annually. This body ordinarily assembles every year in the month of May; but is convoked extraordinarily upon particular occasions: the town of Neufchatel is always the place of meeting.

These three estates are not the representatives of the people; nor do they possess the legislative authority. They are, properly speaking, the supreme court of judicature, which receives all

⁸ The principality of Neufchatel is divided into a certain number of districts; some of which are denominated *châtel-lenies*, and others *mayoralities*. The chiefs of the former are called *châtelains*, and of the latter *mayors*: in every other respect their office and their power is the same.

appeals, and decides finally all causes, even those relating to the sovereignty of the country: a power which they exercised in the year 1707, upon the extinction of the direct line in the person of the dukes of Nemours.

It may be here not unworthy of remark, that the three estates decided the famous cause of the succession in 1707, as a process between the several claimants of the sovereignty. But if (in failure of claimants) a new sovereign was to be chosen, or a new form of government to be established; this would no longer be considered as amenable to a court of judicature: the question would then come before the people assembled by means of their representatives.

The council of state is invested with the ordinary administration of government, superintends the general police, and is intrusted with the execution of the laws. The members nominated by the sovereign are not limited to any particular number. The prince exercises his authority by means of this council, in which he is always considered as personally presiding: and the power of the president is only to convoke the assembly, to propose the subject of their consideration, to collect the votes, and to decide when the voices are equal. The ordinances of this council are previously communicated to the *ministres* of Neuchâtel, who are to certify, that they contain nothing contrary to law.

The town of Neuchâtel enjoys very considerable privileges: it has the care of the police within its own district, and is governed by its own magistracy, consisting of a Great and Little Council. I will not trouble you with a detail of the several departments; but I cannot omit mentioning

the *ministraux*; because the members of that body form the third estate on every act of legislation. The *ministraux* are a kind of committee from the council of the town, and are intrusted with the administration of the police. They consist of the two presidents of that council, four master-burghers drawn from the Little Council, and the *banneret* or guardian of the people's liberties. The six former are changed every two years; the *banneret* is chosen by the general assembly of the citizens, and continues in office during six years.

The legislative authority is divided in so complicated a manner, that it would be no easy task to determine precisely where it absolutely resides: perhaps the following account of the persons concerned, and of the forms observed, in enacting and promulgating laws, may somewhat assist in clearing the difficulty.

As soon as the causes are decided by the three estates assembled in the month of May; the four judges, who form the third estate, retire; and their place is supplied by the four *ministraux*. The attorney-general then desires the members of the three estates to take into consideration, whether it is necessary to frame any new laws. If a new ordinance is proposed; a declaration is drawn up, and delivered to the council of state for their deliberation, whether it is contrary to the prerogatives of the prince, or to the rights of the subject: from thence it is communicated to the council of the town, in order to be examined, whether it infringes the privileges of the citizens. If adopted by the council of state, and the council of the town, it is proposed to the prince for his

approbation or rejection: in the former case, it is again publicly read before the three estates; and the governor, or president, declares the approbation of the sovereign. It is then promulgated, or, as the expression is, passed into a law by the three estates.

Since the accession of the house of Brandenburg, the people of Vallengin are always consulted upon the framing of a new law. For this purpose the three master-burghers of Vallengin examine, whether it contains any thing inconsistent with the franchises of that district; in which case they have the power of remonstrating to the governor in council.

From this detail it should seem, that the legislative authority resides conjunctively in the prince, the council of state, and the town; that the people of Vallengin have a kind of negative voice; and that the three estates propose and promulgate the laws.

Every year, at the conclusion of the assembly of the three estates of Neufchatel, those of Vallengin, as constituting the supreme court of judicature for that county, meet at Vallengin, and decide finally all appeals from the inferior courts of justice. The *first* of these three estates is formed by the same four noble and senior counsellors of state, who sit in the first of the three estates of Neufchatel; the *second* by four mayors of the county of Vallengin; and the *third* by four members of the court of justice of Vallengin, nominated by the mayor of Vallengin. The governor, or, in his absence, the senior counsellor, presides, as in those of Neufchatel. The three estates of Vallengin have no interference in any act of

legislation: the laws which have been framed or amended at Neufchatel, in the manner above mentioned, being simply remitted to them by the solicitor-general, and publicly read before them.

The people of Vallengin assemble every three years in an open plain, in order to elect their three *master-burghers*, who are respectively chosen from the inhabitants of the burgh of Vallengin, of the Val de Ruz, and of the mountains. The function of these master-burghers is to watch over the general interests of the people: they are also in some cases deputed to Neufchatel by the people, whenever they are summoned by the governor and council of state, in relation to any affair which particularly concerns their county.

The principality of Neufchatel and Vallengin is divided into a certain number of districts, each of which has its criminal court of justice. The great circumspection observed in the judicial proceedings, may sometimes favor the escape of the criminal: but the few instances of atrocious crimes, prove that this humane caution is no encouragement to transgressors⁹; and is a strong presumption of the general good morals which prevail among the people. In a word, personal liberty is almost as tenderly and as securely protected by the laws of this country, as by those of our own invaluable constitution.

When the criminal is arrested, he is immediately brought to trial: after which, the sentence

⁹ Is it not possible to persuade of this truth those sanguinary tribunals, who full of the idea that *the law pursues only criminals*, forget that judges ought to seek but after innocents! RAMOND.

is read to him in prison. The next morning he again appears before the judges, assembled in the *open air*; the former proceedings on the trial are read, and the judges once more deliver their opinion. In capital sentences, the governor is instantly acquainted with the circumstances of the crime; and if he does not remit or soften the punishment, the sentence is immediately executed. I am concerned to add, that *torture* (though seldom used) is not absolutely abolished.

Such are the general outlines of this remarkable constitution, by which the liberties of the people are as well, and perhaps better, secured than even in the democratical cantons; for although the most despotic prince in Germany is sovereign, his power is exceedingly limited. Among the striking circumstances which characterize this government, must be mentioned the very liberal encouragement given to strangers, who settle in the country. They enjoy every possible privilege of trade and commerce; and in no state are fewer essential distinctions made between strangers and natives. I have already observed to you, the good effects of this enlarged policy on the population of Neufchatel and Vallengin: whereas a narrower and more contracted principle in some of the neighbouring Swiss cantons, has occasioned, and continues to occasion, a very manifest decrease of inhabitants.

L E T T E R 48.

Route from Pontarlier to Neufchatel—Valley of Travers—Anecdotes of Rousseau—Isle of St. Peter, in the Lake of Bienne.

Neufchatel, October, 1785.

I Now write to you a second time from Neufchatel, at the interval of nine years since the date of my former letters. On the preceding occasion I went from Granfon to Neufchatel; to-day I came from Pontarlier, a small town in Burgundy, which is the usual route of those who enter Switzerland on this side.

From Pontarlier I ascended gently by the side of the Dou, here a small rivulet bubbling in the vale, quitted that stream, and passed under a bold rock, on which stands the castle of Joux forming a picturesque landscape. This castle has a garrison of invalids, and commands the narrow valley leading into Burgundy. Near it the road is divided into two branches; one leads directly to Joigne, and the other to Neufchatel. In about two hours we observed a stone, which separates France from the county of Neufchatel. Soon afterwards we mounted an eminence, looked down upon the beautiful valley of Travers; descended to a narrow pass, which is guarded by a chain fastened to the rock, bearing the date of 1722. History, however, makes mention of this pass, and of a similar chain, at a much earlier period; particularly in 1476, when Charles the Bold, having ineffectually attempted to force it,

marched with his army to Joigne, and besieged Granfon, where he was defeated.

Having descended to St. Sulpice, I visited the source of the Reus, which issues at the foot of a rock in five copious springs, that form a large body of water, and turn several mills. I was accompanied to this picturesque spot by an inhabitant of Fleurier, a neighbouring village: speaking of the increase of industry in these parts, he informed me, that about thirty years ago Fleurier contained only three watchmakers, whereas at present above a hundred were settled in that place. He added, that notwithstanding the constant influx of strangers, hands were still wanting for the numerous trades, which are carried on with great success in these parts.

I continued along the high road leading to Neufchatel, through the beautiful and romantic valley of Travers, watered by the Reus, abounding in the most fertile pastures, bordered by hills gently rising from the banks of the river, and beautifully sprinkled with wood. I travelled through many neat villages, particularly Bouveresse, Couvet, Travers which gives its name to the whole valley; and Noirague, where I quit-
ted the valley, and entered a narrow pass called *Clusette*. From hence the road traverses an abrupt and woody country along the sides of precipices, the Reus rolling beneath in a deep channel. At the small village of Brot, a pleasing view of the lake of Neufchatel and the adjacent country opened gradually, as I descended, and joined the road leading from Granfon to Neufchatel.

I did not quit the valley of Travers without paying a visit to Moitier Travers, rendered memorable by the residence of Rousseau, who being, in 1762, driven first from Geneva, afterwards from Yverdon by the government of Berne, found a refuge from civil and theological persecution, in this secluded valley, under the protection of Lord Keith, governor of Neuchâtel. The dwelling-house of this singular man, is a small wooden building at the further extremity of the village, near the road which leads to Fleurier, and is now occupied by Mr. Martinet, mayor of the valley, a sensible old gentleman, who lived in habits of great intimacy with the philosopher of Geneva.

The room chiefly occupied by Rousseau, is a small bed-chamber, which, out of respect to his memory, is left in the same state as when he lived there. In a corner near the window, he had made a kind of recess formed by two book-cases, and a simple deal plank which reached from one book-case to the other, and on which he was accustomed to write. Rousseau admitted company into this room; but into the recess he suffered no one to enter, from a suspicion, that they would overlook his papers when he was writing. He used also to frequent a small open gallery in the front of the house, the extremities whereof he had enclosed with planks, in which were peep-holes for the purpose of reconnoitring those persons who came to visit him, that he might give his orders whether they should be admitted or refused. Here he walked and read.

During his residence at Moitier, from 1762 to 1765, by frequently sauntering into the fields and neighbouring mountains, he acquired a taste for the study of botany, which he never intermitted, and which he always styled his peculiar delight. During this period of his life, he issued from this secluded corner his *Lettre à l'Archevêque de Paris*, his *Lettres Ecrites de la Montagne*, and some other works; in which he displays those wonderful powers of invention and description, that fascinating yet declamatory eloquence, that glow and animation of style, that fondness for paradoxes, that reverence for the scriptures and yet those perverse doubts of their authenticity, those liberal yet levelling principles of government, that keenness of irony, and that motley mixture of sophistry and argument, which checker and characterize all his writings.

Rousseau, on his arrival at Moitier, appeared in a common dress, but soon afterwards assumed an Armenian habit; either, as he himself alledged, because that mode of clothing was adapted to the disorder with which he was afflicted; or from that affectation of singularity, which seems to have marked his character, in every period of his life. Through Lord Keith's intercession, the king of Prussia offered to Rousseau a pension of *L. 100 per annum*, which he declined, from his aversion to the least shadow of dependence; preferring to copy music for his livelihood, rather than to accept an obligation even from so great a sovereign; and he used to boast, that he could daily earn a guinea by that occupation.

Rousseau

Rousseau took his repast usually alone; though he would sometimes, but very rarely, accept an invitation from Mr. Martinet to dinner or supper; and particularly when Lord Keith passed a week at Moitier Travers for the purpose of visiting him. On these occasions he was remarkably agreeable and lively; being naturally of a social disposition, he conversed with great spirit and animation, and yet with as much correctness, as if he was dictating for the press.

Rousseau seems to have trusted entirely to his own judgment; being so impatient of contradiction, that he would never listen to the admonition of his friends, and seldom asked advice with an intention of adopting it. Having finished his celebrated Letter to the Archbishop of Paris, he read it to a person, from whom I received the anecdote, and demanded his advice relative to its publication. The person, though struck with the fire and spirit of the raillery, yet could not avoid representing to him, that his letter, however forcibly written, would never make a convert of the Archbishop; that he would only be entangled in endless controversies, and draw upon himself much obloquy and ill-will. "Your advice," returned Rousseau calmly, is a little too late; it is already published:" and immediately presented to him a printed copy of the letter, which he had just read to him in manuscript.

He derived from nature an extreme sensibility which bordered upon weakness; he seems to have wanted one proof of a great mind, that of receiving an obligation, and to have possessed such pride and foreness of temper as rendered it impossible to serve him; for he frequently

construed a benefit into an injury. His extreme sensibility was irritated and augmented by a troublesome and painful disorder, which preyed upon his constitution, and at times rendered him unfit for society. And to this complaint, in conjunction with that merciless persecution which he repeatedly endured, should be attributed in a great measure the recluseness of his life, and that suspicious mistrust which occasionally bordered upon madness.

Rousseau had now continued three years at Moitier, greatly delighted with his situation, when an unexpected event induced him to quit a retreat, in which he wished to pass the remainder of his days. This event has been variously related. Some authors assert, that the populace, incited by the minister of the parish, in consequence of the scepticism displayed in his *Lettres Ecrites de la Montagne*, assembled in crowds, broke the windows of his house, forced open the door, and entering his bed-chamber, treated him with such violence, that he escaped with difficulty; and, not to become a martyr to his opinions, quitted the country. Others on the contrary maintain, that neither the minister nor the natives were exasperated against him; that his housekeeper, the same person whom he afterwards married, disgusted with the inhabitants, broke the windows, and persuading her master, that he was in danger of being assassinated, so worked upon his apprehensions, that he quitted Moitier the next morning; and as a proof of this assertion, they affirm, that one of the stones found in the apartment was too large to have passed through the broken panes of glass.

The truth, however, seems to be, that his pride and suspicious temper had rendered him obnoxious to many of the inhabitants; that the scepticism and infidelity of his religious opinions, in his *Lettres Ecrites de la Montagne*, had raised a party against him; that some of the people would occasionally insult him; that the minister of the parish summoned him before the consistory; that he declined appearing; that the council of state at Neufchatel had proposed condemning the abovementioned publication, and had even applied to the king of Prussia for that purpose. Frederic, in an answer, which does honor to his head and his heart, while he permitted them to use any precautions which might tend to prevent the spreading of sceptical opinions, yet wisely forbade all persecution, and ensured to Rousseau a secure retreat at Moitier under his immediate protection. Before this answer was returned, some of the populace, intoxicated with liquor, threw stones against Rousseau's windows with such violence as to penetrate into the kitchen, and to tear off the plaister from the walls; but it is certain that none of these stones did, or could, enter his bed-chamber, as that apartment was situated on the other side of the house. This violence, however, exaggerated by the real or pretended terrors of his housekeeper, was sufficient to alarm Rousseau: on the next morning he retired from Moitier, and took refuge in the island of St. Peter.

The island of St. Peter, sometimes called the island of La Motte, and sometimes Rousseau's island, lies towards the southern extremity of the lake of Bienne. To this delightful spot I made

an agreeable excursion on the fourth of October 1786, in company with the Rev. M. de Meuron, of Neufchatel, and three English gentlemen. We quitted Neufchatel, in the morning; passed through St. Blaise and the district of Landeron, and embarked at Neuville, a small town, which, like Bienne, acknowledges the bishop of Basle for its liege lord, but possesses such rights and immunities as render it an independent republic. It contains about twelve hundred inhabitants. The fine weather, and the clearness of the air, enabled us to enjoy the mild beauties of the view as we sailed to the island. To the south-west we discerned Neuville and its ancient castle, and to the south-east we admired the Julimont, an insulated hill adorned with woods of oak, the summit of which is frequently visited by travellers for the beauty of the prospect; and its name has been derived by fanciful antiquaries from Julius Cæsar. At the extremity of a rocky and woody promontory, which stretches from the foot of the Julimont into the lake, stands the castle of Cerlier, and beyond, at some distance, the fertile plains watered by the Thiele.

We landed on the south side of St. Peter's island, and walked through an agreeable meadow skirted with vineyards to a large farm-house, which was formerly a convent¹, and is now inhabited by the steward of the general hospital at Berne, to which the island belongs.

The island is about two miles in circumference, and richly wooded with various shrubs and trees, particularly with large oaks, beech, and Spanish chesnuts. Its surface is gently undulating; the

¹ It was secularized at the reformation.

southern shore, covered with herbage, forms a gradual slope to the lake; the remaining borders are steep and rocky: in a few places their summits are thinly fringed with shrubs; in others their perpendicular sides are clothed to the water's edge with hanging woods. The views from the different parts of the island are beautiful and diversified; that to the north is the most extensive and pleasing. It commands the lake of Biemme, which is of an oval form; its cultivated borders spotted with villages and castles, with the towns of Nidau and Biemme standing on the farther extremity. Agreeable walks are carried through the woods, and terminate at a circular pavilion placed in the centre of the island. During vintage particularly, and on Sunday, which is the usual day of festivity, the island is filled with parties who take refreshments at the farm-house, stray about the woods, or dance in the circular building, and animate these romantic but solitary scenes.

Rousseau occupied an apartment in the farm-house, the only dwelling in the island. He lived with the steward and his family, who are the present inhabitants. The woman informed me, that he paid for his board and lodging forty shillings a month, that he usually rose at six, dined with the family at twelve, and after a slight supper retired to rest at nine. She added, that he was extremely cheerful and agreeable; conversed with the family with the greatest ease and complacency, and conformed to their hours and manner of living; that he amused himself entirely in wandering about the woods, and searching for plants, which he used to explain to them with

singular satisfaction. Rousseau mentions his residence in this delightful island with the highest terms of rapture, and his usual proneness to exaggeration.

“ I was permitted to remain only two months in this delightful island ; but I could have passed there two years, two centuries, all eternity without suffering a moment's *ennui*, although my whole society consisted of the steward and family, good but plain people. I esteem these two months the most happy period of my life ; and so happy, that I could have passed my whole existence without even a momentary wish for another situation ².”

If we examine in what this *extreme* happiness consisted ; he himself informs us, that his principal occupation was in *doing nothing*. He did not even unpack his books, and could scarcely prevail on himself to read, much less to answer any letters. He assisted the steward and his servants at work in the vineyards and fields ; fauntered about the woods, and gave himself up entirely to botany. He proposed to write a *Flora Petrinsularis*, or a description of the plants in the island ; adding on this head, that as a German had published a book on the kernel of a lemon, in the same manner he would compose a treatise on each species of grass, moss, and lichen ; and that he would not leave the most minute particle of vegetation undescribed. He made occasional excursions on the lake, sometimes coasting the shady banks of the island ; at other times suffering the bark to float without direction into the

² See Promenade V.

middle of the lake: then, to use his own expressions, " he would lie down in the boat, look up to the heavens, and continue in that posture for several hours, enjoying a thousand unconnected and confused, but delicious, reveries." He frequently rowed to a small sandy island, which he describes as a most beautiful spot. It was one of his great amusements to people this little island with rabbits; and as he was conveying, with *great pomp*, the steward's family to be present at the foundation of this little colony, he describes himself as *equally elated with the pilot of the Argonautic expedition*.

From these simple avocations and *every day* occurrences, which Rousseau relates with that enthusiasm and those sentiments peculiar to himself, he draws the following sublime morality.

" I have remarked, during the vicissitudes of a long life, that the most delightful enjoyments and most rapturous pleasures, are not, upon recollection, those with which I am most affected. Such fleeting moments of passion and delirium, however rapturous, are, from their very nature, but thinly scattered in the path of life. They are too rare and rapid to constitute a fixed state; and the happiness which my heart regrets, is not composed of fugitive instants, but consists in a simple and permanent state, without rapture, the duration of which increases the charm, till it finds supreme felicity."

This state he describes himself as possessing during his short continuance in the island of Bienne; a longer residence would probably have dissolved the charm, which was raised by his own heated imagination. That restlessness of temper,

which is usually the attendant of great genius, and which was his inseparable companion, would have probably returned, and embittered the delightful calm which he describes with such rapture and ecstasy. But he had not time to become disgusted with his situation: for the same intolerant spirit which had hitherto pursued him, followed him even to this sequestered island; and he had scarcely passed two months, before he received an order from the government of Berne to depart from their territories. Rousseau was so shocked at this unexpected command, that he petitioned to be imprisoned for life, only requesting the use of a few books, and that he might be occasionally permitted to walk in the open air. Soon after this extraordinary request, which shows the extreme agitation of his mind, and which cannot but interest every feeling mind, he reluctantly quitted the island. It does not fall within the compass of a letter to dwell upon this singular man through the subsequent events of his life, or even accompany him to England, where, notwithstanding the most distinguished reception, the same perverseness of disposition, and the same excessive delicacy, rendered him no less unhappy, than when he was under the pressure of real calamities, and exposed to reiterated persecutions.

I am, &c.

L E T T E R 49.

Environs of Morat—Mount Vuilly.

I N our way to Morat and Avenches we crossed the river Thiele, which issues from the lake of Neufchatel, discharges itself into that of Bienne, and separates the principality of Neufchatel from the canton of Berne.

Morat is a bailliage belonging to Berne and Friburgh: the reformation was introduced in 1530, by the majority of voices, in presence of deputies from Berne and Friburgh. The free spirit of the Swiss governments is in no instance more remarkably apparent, than by the mode which they observed in embracing, or rejecting, the reformation; as, in many other towns beside Morat, the question was put to the vote; and the minority generally submitted, with perfect acquiescence, to the decision of the greater number.

Morat stands pleasantly upon the edge of a small lake, about six miles long, and two broad; in the midst of a well-cultivated country. The lakes of Morat and Neufchatel are parallel to each other, and separated only by a ridge of hills: the former is the most elevated; for, it discharges itself by means of the river Broye, into the latter. According to Mr. de Luc, the lake of Morat is fifteen French feet above the level of that of Neufchatel. Both these lakes, as well as that of Bienne, formerly extended much farther than their present limits: and, from the position of the country, appear to have been once united.

Mr. Pennant informs me, that “ the vast fish called the *silurus glanis*, or the sheatfish, which frequents the lakes of Morat and Neufchatel, has not been caught here in the memory of man. It is well described, and finely engraven, in Doctor Bloch’s History of Fishes, vol. i. 194. tab. 34. In the time of Gefner two were taken, one of which was eight feet long; but they are sometimes so large as to weigh six hundred pounds. It is an eel-shaped fish, very smooth, round and thick, and has a great head. The mouth is furnished with four short, and two very long, whiskers. It is very inactive and slow in its motions, and loves the deep and muddy parts of the lakes. They are found in many of the great fresh waters of Europe, and abundantly in the Volga.”

On my subsequent expeditions into these parts, I examined with greater attention the environs of Morat, during several days, which I passed most agreeably at Coujouvaux, a feat belonging to the count of Diesbach, and at Grens with M. de Garville, a French gentleman, who is so much attached to the beauties of this delightful country, that he has built a villa in a pleasing situation near the banks of the lake of Morat, where he comes every year from Paris to pass the summer. By these families I was received without any other introduction, than as being the author of the Letters on Switzerland, and with that frankness and cordiality so flattering to a stranger. I found the environs of Morat, though not so wild and romantic as many other parts of Switzerland, yet extremely desirable for a constant residence.

I made several excursions across the lake, to an insulated ridge between the lakes of Neufchatel

and Morat, and enjoyed many delightful points of view. Of these various prospects, the most remarkable is from the summit of Mount Vuilly, where I seated myself on the edge of an abrupt precipice. From thence I looked down upon the lakes of Bienne, Morat, and Neufchatel; observed the Broye entering the lake of Morat, issuing from thence and winding through a marshy plain into the lake of Neufchatel; the Thiele flowing from the latter, and hastening to fall into the lake of Bienne; the fertile and variegated countries encircling those bodies of water; and the grounds rising in regular gradations from plains to alps. But what renders this charming spot more particularly striking is, that it is perhaps the only central point from which the eye can at once comprehend the vast amphitheatre formed, on one side, by the Jura stretching from the environs of Geneva as far as Basle, and, on the other, by that stupendous chain of snowy alps, which extends from the frontiers of Italy to the confines of Germany, and is lost at each extremity in the immense horizon.

Impressed with this sublime view, I cast my eyes downwards over that dead and extensive morass through which the Broye serpentine; and cried out in the language of poetry, which knows how to animate the dullest objects:

Quittons les bois & les montagnes

Je vois couler la Broye³ à travers les roseaux.

³ From a poem, entitled "*La vue d'Anet.*" I have followed the example of M. Sinner, in his *Voy. Hist. & Pol. de la Suisse*, who substitutes the Broye for the Thiele, to which the lines in the original are applied.

Son onde partagée en différens canaux
 S'égare avec plaisir dans de vertes campagnes,
 Et forme dans la plaine un labyrinthe d'eaux.

Rivière tranquille & chérie,

Que j'aime à suivre tes détours !

Ton eau silencieuse en son paisible cours,
 Présente à mon esprit l'image de la vie ;
 Elle semble immobile , & s'écoule toujours.

L E T T E R 50.

Battle of Morat — War between the Swifs and Charles the Bold, Duke of Burgundy — Its Consequences.

MMORAT is celebrated for the obstinate siege it sustained against Charles the Bold, duke of Burgundy, which was followed by the battle of Morat, fought on the 22d of June 1476. In this famous engagement the duke was routed, and his whole army almost entirely destroyed, by the confederate troops of Switzerland. Not far from the town, and adjoining to the high road, a monument of this victory still remains: it is a square building, filled with the bones of the Burgundian soldiers, who were slain at the siege and in the battle. To judge from the quantity of these bones, the number of the slaughtered must have been considerable. Among several inscriptions in the Latin and German languages, relative to that memorable victory, I transcribed the following on account of its conciseness:

*Deo Opt: Max:
 Caroli Inclyti et Fortissimi
 Burgundiæ Ducis Exercitus
 Muratum obsidens ab Helvetiis
 Casus hoc sui Monumentum reliquit.
 Ann: 1476.*

This war, which Charles the Bold carried on against the Swiss with a temerity peculiar to himself, forms a remarkable era in the history of this country; and was attended with some very extraordinary circumstances. From the time of the famous revolution in 1308, which gave rise to the Helvetic confederacy, to the end of the following century, the Swiss republics deprived the House of Austria of all its territories situated in Switzerland; and continued in possession, notwithstanding the various attempts of the different dukes to recover their lost domains. But of all the princes of that House, Sigismund the simple, archduke of Austria of the branch of Tyrol, was more particularly engaged in hostilities with the Swiss cantons, and their allies: for, his hereditary dominions in Suabia and Alsace bordering upon Switzerland, induced him to enter more frequently into these disputes, than the other branch, which was in possession of the imperial throne.

In the course of these hostilities, Sigismund was compelled to cede a considerable part of his

⁴ Thanks to the Almighty! The legions of the gallant Duke of Burgundy, besieging Morat, being defeated by the Swiss, being left this monument of their passage behind.

territories to the Swiss republics, particularly the rich country of Thurgau to the seven cantons, which at that period composed the Helvetic league⁴. Inflamed by these repeated losses, and the humiliating conditions of peace he was constrained to accept in 1468, he endeavoured to engage some of the neighbouring powers in a confederacy against the Swiss cantons. Having first ineffectually applied to Louis the Eleventh king of France, he at length addressed himself to Charles the Bold, duke of Burgundy.

Charles having succeeded to the possession of Franche Comté, Burgundy, Artois, and Flanders, together with the greatest part of the United Provinces; possessed as ample revenues, and as extensive territories, as the most potent sovereign of his time. Magnificent, impetuous, and enterprising, he neglected no opportunity of aggrandizing his power, and set no bounds to the projects of his restless ambition. He had formed the plan of erecting Burgundy into a monarchy; and had already in imagination appropriated to himself Lorraine and part of Switzerland; which he proposed to annex by conquest to his hereditary dominions.

A prince of such a character being naturally well disposed to listen to any overtures, or to undertake any war, that might advance his ambitious schemes, received with eagerness the propositions of Sigismond; he flattered that credulous prince with the hopes of receiving in marriage his daughter Mary, heiress of his extensive

⁴ Berne obtained the co-regency of Thurgau at the peace of Arau, 1712.

dominions; and prevailed upon him by the loan of eighty thousand florins, to surrender Sundgau, Alsace, Brisgau, and the four Forest-towns; promising, upon the repayment of that sum, to restore the said provinces.

By this alliance, Sigismond acquired a sum of money to assist him in his preparations against the Swiss; protected, as he thought his hereditary dominions from their enterprises; and secured a powerful ally against the ancient enemies of his family. The reverse, however, proved to be the event: for, by a strange fatality, this league, which was intended to cement the union of the two princes, served only to divide them; and occasioned the first perpetual alliance between the Swiss cantons and a prince of the House of Austria.

Charles, upon the conclusion of this treaty, informed the cantons, that he had taken Sigismond under his protection, and would defend him to the utmost of his power. Meanwhile, the bailifs, whom he placed over his newly acquired territories in Alsace, oppressed the people; laid embargoes upon the commerce of Mulhausen, a confederate of the cantons; and withheld the rents of the estates belonging to the Swiss in Sundgau and Alsace.

These grievances being laid before Charles in an embassy, which Berne dispatched to his court in the name of the confederate cantons, the duke received it with haughtiness; and after compelling the deputies to kneel while they delivered their remonstrance, dismissed them without an answer. This disdainful and ignominious treatment was ill brooked by a free people, unaccustomed to crouch before the insolence of power;

and the warmth of their just indignation was still more inflamed by the artful policy of Louis the Eleventh, who, jealous of the duke of Burgundy's power, entered into a defensive alliance with the Swiss republics, in order to counteract the designs of that ambitious prince.

But Louis still further strengthened the Swiss, by effecting a reconciliation between them and Sigismond. The latter had no sooner surrendered to Charles Sundgau, Alsace, and the other dominions, than he began to be sensible of his error. The duke of Burgundy not only oppressed his new subjects, but seemed determined, even should the eighty thousand florins be repaid, to keep possession of these conditional territories, and did not appear inclined to fulfil the promise of bestowing his daughter upon the archduke. From these considerations, Sigismond, induced through the mediation of Louis, to throw himself under the protection of the Swiss, concluded the famous treaty, which was confirmed at Lucerne in 1474, and is called the *hereditary union*; an appellation appropriated to the treaties between the Swiss and the House of Austria. Sigismond renounced all right to the provinces which the Swiss had conquered from the House of Austria: the two contracting parties formed a defensive alliance; and engaged to guarantee recipocally each other's territories. Thus the Swiss, after having deprived Sigismond of all his possessions in their country, engaged to support his title to those very provinces, which he had mortgaged in order to strengthen his arms against themselves; and Sigismond accepted a guarantee from the most inveterate enemies of his family.

This

This treaty, which entirely changed the policy of the Swiss republics, was solely contrived by the artful intrigues of Louis the eleventh: the jealousy of that designing monarch turned into another channel the vast preparations of the duke of Burgundy; preparations which would probably have been attended with more success, had they been directed against France.

Charles too late perceiving the imprudence of his conduct towards the Swiss republics, in vain exerted all his efforts to engage them in a neutrality. They rejected his proposals of reconciliation with firmness, prepared, with their usual vigor, for a war, which now appeared inevitable, and even advanced the eighty thousand florins to Sigismond, who demanded the restitution of his lands, which the duke of Burgundy evaded under various pretexts. The latter having concluded a separate peace with Louis, turned his whole force against the Swiss, entered their country with an army of sixty thousand men; and, laying siege to Granson, carried it by assault. But his success ended there: for, at the subsequent battles of Granson and Morat, he was totally defeated, and his attempts upon Switzerland entirely frustrated⁶. Nevertheless, his restless

⁶ Charles entered Switzerland confident of subduing that country. The effect which this unexpected and humiliating disappointment had upon his spirits and constitution, is related by Philip de Comines, with his usual minuteness, in his Memoirs addressed to Angelo Cattho, archbishop of Vienne in Dauphiné. His account is curious, and will give some idea of the violent and impetuous character of Charles:

“ His concern and distraction for his first defeat at Gran-
“ son was so great, and made such deep impression on his

and ambitious spirit still unsubdued, impelled him to attack the duke of Lorraine. But that prince, having engaged in his pay a body of eight thousand Swifs, obtained a complete victory, near Nancy, over Charles, who was slain in the engagement⁷.

His death terminated this bloody war; in which the Swifs gave the most distinguishing proofs of invincible valor, and spread the fame of their military virtues throughout all Europe, but from which they obtained no solid advantage⁸. In

“ spirits, that it threw him into a violent and dangerous fit
 “ of sickness: for, whereas before, his choler and natural
 “ heat was so great, that he drank no wine, only in the
 “ morning he took a little tisane, sweetened with conserve
 “ of roses, to refresh himself: this sudden melancholy had so
 “ altered his constitution, he was now forced to drink the
 “ strongest wine that could be got, without any water.
 “ And, in order to draw the blood from his heart, some
 “ burning tow was put into the cupping-glasses, and ap-
 “ plied to his side. But this, my lord of Vienne, you know
 “ better than I; for, your lordship attended on him during
 “ the whole course of his illness, and spared no pains that
 “ might contribute to his recovery: and it was by your per-
 “ suasion that the duke was prevailed upon to cut his beard,
 “ which was of a prodigious length. In my opinion his un-
 “ derstanding was never so perfect, nor his senses so sedate
 “ and composed, after this fit of sickness, as before.”

Uvedale's Transf. Vol. I. p. 423.

⁷ The death of Charles at the battle of Nancy, was attended with some very extraordinary circumstances; for the particulars of which, see the curious account, extracted from Philip de Comines, and the *Chronique Scandaleuse* of John de Troyes, in Wraxal's interesting *Memoirs of the Kings of France of the House of Valois*.

⁸ “ And what,” says Comines, “ was the occasion of
 “ this war? It was begun on account of a waggon of sheep-
 “ skins, which the lord of Romont took from a Swifs, who

fact, the principal and almost sole benefit accrued to Louis the Eleventh; as by the death of Charles, he not only was released from a dangerous and enterprising rival, but also annexed the rich provinces of Burgundy and Artois to the crown of France.

But, although the immediate advantages which the Swifs derived from the death of Charles, were unimportant; yet the consequences operated very considerably on their future politics. Mary of Burgundy, the only surviving child and heiress of Charles, married the archduke Maximilian, eldest son of the emperor Frederic the Third, and afterwards emperor himself. By this marriage, the House of Austria acquired possession of the Netherlands; and having frequent disputes with France, the alliance of the Swifs was strenuously courted by both parties. Thus this country, being secured from all invasions, acceded as occasion offered to the two rival powers; and assisted each party by turns, as the intrigues, or rather as the subsidies, of the one or the other prevailed.

“ was passing through his territories. If God had not abandoned the duke, it is not probable, that he would have put himself into so much danger for so trifling a circumstance; considering the offers that were made to him; against what sort of people he was engaged; and from whence neither profit nor glory could accrue to him. For, the Swifs were not in such repute, as they are in at present, and nothing could be poorer: insomuch that one of their ambassadors, as he was endeavouring to prevent the duke from engaging in that war, remonstrated; that he could gain nothing by attacking them: for, their country was so barren, that the spurs of his troops and the bits of their horses were worth more, than could be furnished by all the Swifs territories, in case they were conquered.”

These intrigues gave rise to different alliances, contracted with the House of Austria, the kings of France, the pope, and the dukes of Savoy and Milan. — But, not to enter more minutely into their history, I will only observe in general, that hitherto the Swifs had acted with great disinterestedness in all their treaties, and had never taken the field but either to secure their liberties, or to drive their enemies from Switzerland. It was about the period of the Burgundian war, that the subsidies which they obtained from Louis the Eleventh, taught them the disgraceful arts of mercenary politics; as the rich plunder which they took from the duke of Burgundy gave, in some measure, the first taint to their original simplicity of manners; till at length, *Swifs venality* has become a proverbial expression.

I am, &c.

LETTER 51.

Antiquities of Avenches.

FEW ancient towns have occasioned more controversy among antiquarians, or given rise to such a variety of conjectures concerning its origin and importance, as Avenches, the principal burgh of a bailliage in the Pays de Vaud. Some contend that it was the capital of all Helvetia; because Tacitus calls it *Aventicum gentis caput*: while others have endeavoured to prove, that by this expression the historian intended only to

denote the capital town of its particular district. Agreeably to some accounts, the city was built, and a Roman colony founded, by Vespasian: with more probability, according to others, it was only repaired and beautified by that emperor, after it had been laid waste, and almost ruined, by Vitellius.

Without entering however into dry and uninteresting discussions, it was formerly a very considerable town, and under the dominion of the Romans; as appears not only from several milestones, found in many parts of the Pays de Vaud, most of which are numbered from *Aventicum*, as the principal place of reference; but more particularly from the present ruins. I shall slightly mention a few of these ruins, merely to show you, that the inhabitants do not boast of their antiquity without sufficient evidence.

We traced the site of the ancient walls, which appear to have enclosed a space near five miles in circumference. The present town occupies but a very inconsiderable part of this ground; the remainder is covered with corn-fields and meadows. One of the ancient towers still exists: it is a semicircular building, with the convex side turned towards the town.

We next examined a coarse mosaic pavement, discovered some years ago in ploughing a field. Being now enclosed by a barn, which is let to some peasants, the ignorant occupiers are taking the most effectual method to destroy it, by employing it as a drying-house for tobacco, and by suffering strangers to take away specimens. Even the government of Berne was so insensible of its value, that they permitted the count of Caylus

to remove a pannel, containing the figures of two Bacchanalians.

This mosaic was the floor of an ancient bath, and is about sixty feet in length and forty in breadth: the general form is perfect; and, although several parts are broken and lost, yet from the present remains the configuration of the whole may be easily traced.

The pavement consists of three compartments: those at each extremity are regularly divided into fifteen octagons, eight small squares, and sixteen small triangles. Five of these octagons in each compartment, represented human figures in various attitudes, but chiefly Bacchanalian men and women: the remaining octagons were composed of three different patterns. The vacant parts between the octagons are filled with the small squares; and towards the outward border, with the small triangles. The middle compartment is divided into oblong pannels; in the largest of which is an octagon bath of white marble, of about six feet in diameter, and a foot and a half deep: the sides of the bath are ornamented with dolphins. Of these three compartments, one is almost perfect; the others are very much defaced. Each of the pannels is encircled with several borders prettily diversified; and a general border encloses the whole.

Schmidt, in his *Recueil d'Antiquités de la Suisse*, ingeniously conjectures, from a glory which surrounds a head of Bacchus in this mosaic, that it was wrought during some part of the intervening age between Vespasian and Marcus Aurelius; because that mark of divinity is not usual upon any monuments of Roman antiquity prior to that

period. He adds, that the same kind of *glory* is observed upon the head of Trajan in an ancient painting at Rome; upon that of Antoninus Pius on a medal; and on the arch of Constantine⁹. He strengthens this conjecture, by further remarking, that the head-dress of a Bacchanalian woman represented in this mosaic, resembles the head-dress on the medals of the empresses Plotina and Sabina¹.

From thence we were conducted to the ruins of an ancient amphitheatre, within the walls of the bailif's garden. The general form and size of this building are tolerably perfect, as also parts of the brick walls which enclosed it. The diameter of the arena was, as well as we could judge by pacing it, about eighty yards; which must necessarily have been an uncertain estimate: as a former bailif brought in a considerable quantity of earth, in order to plant fruit-trees; conceiving, I suppose, that good fruit was of more value, than to be able to determine the precise extent of an ancient amphitheatre. Under a tower, partly built of Roman materials, is a cell in which the animals were probably let loose upon the arena. On the outside are still to be seen the remains of five dens: and the

⁹ The arch of Constantine at Rome being partly formed from the Forum of Trajan, the architect improperly transferred the figures. This circumstance accounts for the *glory* observed round the head of Trajan, on the arch of Constantine, which has been supposed to have represented the head of Constantine.

¹ The curious reader will find in the *Recueil*, cited in the text, a very accurate description and engraving of this mosaic.

walls are adorned with several pieces of rude sculpture considerably defaced.

Not far from these ruins stands a large column of white marble, about fifty feet in height, composed of large masses, nicely joined together without cement; and near it lies a considerable fragment of defaced sculpture, which seems to have once formed part of the portal belonging to a magnificent temple. At a small distance from this column, in the high road, we observed a cornice of white marble, sculptured with urns and griffins. As we walked through the town, we remarked several other masses of cornice, ornamented with sea-horses and urns; and some marble columns of beautiful proportions.

About a mile from Avenches, near the village of Coppet, on the other side of a little stream, which separates the canton of Friburgh from that of Berne, are the remains of a small aqueduct. They were discovered about fifteen years ago, by the accidental falling of a sand-hill which covered the aqueduct. The outside is formed of stones and mortar, and the inside of red Roman cement; the vault of the arch may be about two feet and a half high, and one and a half broad. This aqueduct has been traced to the east-side of the town, and also to near the marble column before mentioned. We were also informed that it extends to the tower of Gausa, between Vevay and Lausanne; and that, between Villarfel and Marnau, about four leagues from Coppet, an arch of nearly the same dimensions is excavated in the solid rock. But whether these several parts actually communicated with each other, or indeed whether they really exist,

are facts which, (having only viewed those remains that are visible near this town) I must be contented to rest on the credit of my informers.

P O S T S C R I P T.

WHEN I visited the ruins of Avenches in October 1786, I had much satisfaction in finding, that the bailif, Mr. Tſcharner, paid great attention to these remains, and particularly to the mosaic. I could not avoid remarking to the bailif, who politely favored us with his company; that every lover of antiquity must regret, his predecessors had not shown the same taste; as the ruins of Avenches would have been a greater object of curiosity. Several excavations had been lately made, at first by Lord Northampton, who has a house in the neighbourhood, and continued at the expense of Berne. A coarse mosaic pavement, a few fragments of walls rudely painted, and some trifling remains of ancient baths, are the only vestiges of antiquity hitherto discovered.

I am, &c.

*Observations on the Antiquities of Cheyres, by
the Translator.*

No where in Gaul the Romans left behind them so many monuments, as in the Pays de Vaud, and principally on the Southern banks of the lake of Neufchatel. But notwithstanding the great number that have been discovered, many more remain still buried under ground; and the farmers, who in ploughing or digging, find any ruins or subterraneous

buildings, carefully hide them, for fear of endangering their propriety, should the treasures it incloses be known.

In the neighbourhood of *Cheyres*, a bailiwick in the canton of Friburgh, on the banks of the lake of Neufchatel, a few leagues from Avenches, Mr. de *Castella*, the bailif has lately discovered an entire mosaïc which has been well conserved. As this place does not lie in his jurisdiction, but in that of the bailif of Granfon, which stretches to the Eastern banks of the lake, the government of Friburgh, in consideration of the zeal and knowledge of Mr. de *Castella*, committed to him the pursuit of this discovery, together with the care of its conservation, to which the bailif of Granfon has consented: and the lovers of antiquity need not fear that this fine monument will ever share the fate of that of Avenches.

This mosaïc has been discovered about a quarter of a league from the road between Yverdun and *Cheyres*, on the declivity of a pleasant hill, which commands the sea, and by the side of a limpid spring. Higher up this hill grows rugged and steep, and is mantled with a gloomy forest of firtrees.

The pavement has about fifteen feet in the square. The subject seems to be Orpheus environed by animals listening to his music. The god, with a lyre in his hand, and accompanied by a bird and a leopard, occupies the centre of a circle surrounded by several separate cartouches representing different animals; the whole is encircled with a diversified border; and enclosed with a wall on which a door and a window are still to be seen. In the neighbourhood is a piece of a stone-column. This mosaïc seems to have been covered by a wall, which, by bursting, caused part of it to bend. Among the stones, composing its sidewalls, several were remarked that must have been exposed to a violent fire; and in the rubbish a great many cinders were found. In after times some highlanders built on this vault a wooden house, which, being consumed by the flames, caused it to fall in; and its ruins, confounded with more modern rubbish, buried the venerable work of past ages. In the composition of this mosaïc five different kinds of stones, have been

employed; greyish white for the ground; black for the design; and blue, red and green for the figures. The two latter sorts seem to be vitrifications, and colored by art, which is rarely met with in the mosaics of the ancients.

On the outside there has been discovered an aqueduct, falling perpendicularly on one of the sidewalls of the building.

Some leagues from *Cheyres*: near Yverdun, Mr. *Bourgeois*, banneret, discovered an other mosaic in a field of his. The whole piece was already dug out, when through the awkwardness of the workmen whom he could not survey, this fine monument was broken to pieces. Its subject was also Orpheus surrounded by animals: the pavement was divided into three compartments; one of which contained quadrupeds, another birds, and a third fishes. Although the distribution on this latter piece is very unlike that of *Cheyres*, yet the similarity of the subject is worthy of notice; it seems to allude to the apparition of the arts in the gloomy forests of Helvetia; and perfectly becomes the Romans who brought into its deserts the delights of the capital of the world*.

L E T T E R 52.

*Town and Canton of Friburgh — Population —
Government — Secret Chamber.*

FRIBURGH was built in 1179, by Berchtold the Fourth, duke of Zæringen, who endowed it with considerable privileges. Upon the extinction of the male line of the house of Zæringen,

* when these different discoveries were made I had already left Switzerland, and am beholden for the above description to the communication of a distinguished traveller.

in 1218¹, Ulric of Kyburgh obtained the sovereignty, in right of his wife Anne, sister of the last duke Berchtold the Fifth. It came by marriage into the possession of Eberhard count of Habsburgh-Lauffenburgh; who sold it to his cousin Rhodolph of Habsburgh, afterwards emperor. During this period, a continual rivalry subsisting between Berne and Friburgh, they were frequently engaged in mutual hostilities: at length all differences were composed; and the two cities, in 1403, entered into a perpetual alliance.

Friburgh continued under the dominion of the house of Austria, and was concerned in all the quarrels in which that family was engaged with the Swiss republics, until the middle of the fifteenth century; when, by a very singular revolution, it renounced all allegiance to the archduke Albert, and put itself under the protection of the duke of Savoy. From this era it occasionally assisted the cantons against the house of Austria; and in the war between the Swiss and Charles the Bold, its troops had a share in the victories of Granson and Morat. Soon after the

² The house of Zæringen was descended from the ancient counts of Alsace, by Berchtold count of Brisgau. His grandson, Berchtold the Second, built the castle of Zæringen, situated near a village of the same name, not far from the present town of Friburgh, capital of the Brisgau. Upon the demise of Berchtold the Fifth, the last duke, without male issue, his territories were divided between his collateral heirs, the dukes of Teck, and his two sisters Agnes and Anne. Agnes married Egeno, count of Urach; by which marriage he obtained possession of Friburgh in the Brisgau: his posterity were called counts of Friburgh. Anne married Ulric, count of Kyburgh: their daughter Hedwige, was wife of Albert count of Habsburgh, and mother of the emperor Rodolph the first.

battle of Morat, it became a free and independent republic; and, in 1481, was admitted a member of the Helvetic confederacy.

The situation of the town, though not one of the most beautiful, is certainly one of the most picturesque and wild in Switzerland. It stands partly in a small plain, partly on bold acclivities, on a ridge of rugged rocks, half encircled by the river Sane; and is so entirely concealed by the circumjacent hills, that the traveller scarcely catches the smallest glimpse, until he bursts upon a view of the whole town from the overhanging eminence.

The fortifications, which consist of high stone-walls and towers, enclose a circumference of about four miles; within which space the eye comprehends a singular mixture of houses, rocks, thickets, and meadows, varying instantly from wild to agreeable, from the bustle of a town to the solitude of the deepest retirement. The Sane winds in such a serpentine manner as to form in its course, within the space of two miles, five obtuse angles, between which the intervening parts of the current are parallel to each other.

On all sides the descent to the town is extremely steep: in one place the streets even pass over the roofs of the houses. Many of the edifices are raised in regular gradation like the seats of an amphitheatre: many overhang the edge of a precipice in such a manner, that on looking down, a weak head would be apt to turn giddy; and an unfortunate lover, repulsed in his suit, might instantly put an end to his pains, by taking a leap from the parlour-window, without the trouble of a journey to Leucate, or to the rocks of Meillerie.

But the most extraordinary point of view is from the Pont-neuf. To the north-west, part of the town stands boldly on the sides and the piked back of an abrupt ridge; and from east to west a semicircle of high perpendicular rocks is seen, whose base is washed and undermined by the winding Sane, and whose tops and sides are thinly scattered with shrubs and underwood. On the highest point of the rocks, and on the very edge of the precipice, appears, half-hanging in the air, the gate of the town called Bourguillon: a stranger standing on the bridge would compare it to Laputa, or the Flying Island in Gulliver's Travels, and would not conceive it to be accessible but by means of a cord and pulleys. In the midst of the river I observed a large fragment of stone, which a few years ago fell from the rocky heights, was carried under one of the arches, and in conjunction with other fragments stopping the current, raised it more than ten feet above its usual level, threatening the lower parts of the town with a sudden inundation.

A traveller fond of wild and romantic scenery will not fail to visit the Moulin de la Motte, and the valley of Goteron. The Moulin de la Motte is a miller's dwelling, hollowed in the midst of an impending rock; near it issues a small torrent, which turning the mill, falls within a few paces into the Sane. This singular dwelling seems so far removed from "*the busy hum of men,*" as to be rather situated in a remote solitude, than within the walls of a fortified town. Near it there is an ascent of four hundred steps to the Place des Fontaines, in the upper part of the town.

The valley of Coteron, which lies on the north-west of the town near the bridge leading to Berne, takes its name from the Goteron, a small rivulet that runs through it, and turns several mills. This valley, extremely narrow and above two miles in length, is bounded on each side by high and overhanging rocks of sand-stone. M. Vernet, the celebrated landscape painter, is said to have studied these rocks with great attention; and frequently to have declared, that, excepting those of Tivoli, he never saw any rocks whose varying tints had a more pleasing and harmonious effect. The valley contains several mills; an iron foundery, where the ore brought from Franche Comté is forged; and a manufacture of printed linen and cotton, lately established by some merchants of Neufchatel, under the protection and encouragement of government.

The houses of Friburgh, constructed with a grey sand-stone drawn from a neighbouring quarry, are neat and well-built; but the whole town has a dull and inanimate appearance.

Among the few objects worthy of particular notice in the town, are, the cathedral, an elegant Gothic edifice, erected in the latter end of the 14th century, and remarkable for the height and solidity of the tower; the town-house, an ancient building, which formerly composed part of the palace belonging to the dukes of Zæringen; and also a lime-tree, in the middle of the principal square. Tradition reports, that this tree was instantly planted by one of the soldiers, the 22d of June 1477, on his return from the battle of Morat: an emblem of Swiss liberty, which took deep root on the memorable defeat of Charles

the Bold; and thus remaining firm against the conflicts of time, has continued to spread and flourish, to the admiration and example of future ages.

The society of Friburgh is extremely agreeable; the gentry are frank and hospitable, and blend French politeness with great simplicity of manners. Dinner is usually served at twelve; and supper seldom later than eight. I never experienced a more cordial reception in any town of Switzerland.

The bishop of Lausanne, called here the bishop of Friburgh, resides in this city. He is appointed by the pope, usually at the recommendation of the French court; and his revenues, including a small pension from France, and from the abbey of Hauterive, of which he was abbot, amount to about *L. 400 per ann.* His diocese extends over the whole canton, and part of that of Soleure. In all his acts and deeds he signs himself Bishop and Count of Lausanne, and prince of the German empire.

The present bishop, Bernhard of Lenzburgh, is a man of letters, and an honor to his profession: he is employed in preparing for the public a biography of the illustrious and learned men born in the canton of Friburgh, who have distinguished themselves, either in the civil, military, or literary line.

This canton is entirely catholic. Its population in 1785 may be estimated from the following table.

The

The town contained	—	—	5,011
The environs	—	—	15,500
The remainder of the canton	—	—	33,078
Absentees	—	—	4,000
Number of inhabitants	—	—	57,589

The sovereign power resides in the Great Council of Two hundred; comprising the two Advoyers, the Chancellor, the Grand Sautier, the Senate, or Little Council of Twenty-four, the Sixty, from which body are chosen the bannerets and principal magistrates, and the remaining hundred and twelve members, who are simply denominated Burghers.

The only persons capable of being elected members of this sovereign council, and of course enjoying any share in the government, are the *secret* burghers, or a certain number of families divided into four *bannieres*, or tribes of the town: they are called *secret* burghers, in order to distinguish them from the other citizens, partly inhabiting the town, and partly the twenty-four parishes in the environs. The latter enjoy the right of appointing the advoyers, from certain candidates proposed by the sixty, and of annually confirming the said magistrates. Hence many authors have called this government aristo-democratical, but erroneously: for, as the power of the people is confined to the act of choosing and confirming the two advoyers; and as the supreme authority absolutely resides in the council of two hundred, necessarily supplied by a limited number of patrician families, the government is, in the strictest sense, a mere aristocracy.

Instead of troubling you with an uninteresting detail of those points in which the government of Friburgh resembles that of the other aristocratical cantons, I shall confine myself to those peculiar circumstances by which it is discriminated from them. This difference may be principally said to consist in the three following articles:

1. The *blind ballot*, or mode by which several important offices are supplied, and particularly by which the members of the senate and the sixty are chosen. This mode of election was instituted in order to prevent venality; and is too singular not to be distinctly explained. The names of the candidates are placed privately in a box, containing as many partitions as there are persons who solicit the charge. Into each of these partitions the electors throw in their suffrages as chance directs, without knowing to whom they may happen to give their votes; and the candidate who has the most of these casual ballots is elected.

2. The clause which disables certain noble families from bearing the office of banneret, or from being chosen members of the *secret chamber*. These families are sixteen in number: some were acknowledged noble, even as early as the foundation of the republic; others successively obtained titles of counts and barons from the foreign princes to whom they were attached, and in whose armies they had served.

3. But the most remarkable circumstance which discriminates the constitution of Friburgh from that of the other aristocratical cantons, is a committee distinguished by the name of the *Secret Chamber*, which, though not any public or responsible part of administration, is yet the concealed

spring that puts the wheels of government in motion. As the prerogatives and operation of this *secret chamber* are in general but little known, and still less understood; I flatter myself that it will not be uninteresting to lay before you a concise account of its origin and constitution.

The *secret chamber*, forming a part of the council of sixty, is composed of the four bannerets, who are reciprocally chosen by the council of two hundred from the four tribes; and of twenty-four members, who are appointed by a majority of their own body: the former remain in office four years; the latter continue for life.

The *secret chamber* assembles ordinarily four times in the year, or oftener if occasion requires: and is convoked by a banneret. The two principal meetings of this body are between the Sunday before St. John's day and the twenty-fourth of June; and usually on the anniversary of the battle of Morat, for the purpose of appointing the vacant places in the council of two hundred; and on Tuesday in Whitsun-week, when they supply the vacancies in their own body.

Its origin is thus traced in the records of the republic. From 1347 to 1387, the three bannerets nominated twenty persons from each of the three tribes into which it was then divided; and these sixty assembled on the Sunday before St. John's day, to establish the Little Council and elect the treasurer; from hence is derived the origin of the sixty, and of the assembly which meets on the Sunday now called *Secret Sunday*. It consists of the whole council of two hundred, excepting the advoyers and senate, and is presided by the chancellor, the four bannerets, and the members

of the *secret chamber*, who take the places of the senators. This assembly reviews, confirms, or censures, if necessary, the senators, the bannerets, and the sixty; the members of each tribe retire, while their conduct is examined and reviewed by the remainder. The same assembly fills up also the vacant places in the senate, and in the sixty, by blind ballot.

In 1387, the nomination of the sixty was transferred from the bannerets to the assembly which met on the *Secret Sunday*: and that assembly was also empowered to appoint the Little Council, the treasurer, the sixty, and the remaining members of the two hundred. By a charter of the same year, four coadjutors, drawn from the sixty, are given to each banneret: and it appears that these coadjutors were chosen, in the same manner as the bannerets, separately by each tribe: and this may probably be considered as the origin of the *secret chamber*. A charter of the year 1392, confirms the *Secret Sunday*, in the right of nominating the sixty, and confers on the bannerets that of choosing the *prud-hommes*, who accompanied them when they convoked the people on St. John's day; and it is probable that the bannerets also appointed their coadjutors. This nomination took place, as at present, on the Tuesday in Whitsun-week. The town being at that period only divided into three tribes, the coadjutors were limited to twelve; and when a fourth tribe was added, their number was augmented to sixteen.

A charter dated 1404 confirms, in many instances, the above mentioned arrangements; but does not grant to the *Secret Sunday* the nomination of the two hundred: a right at that time

enjoyed by the bannerets, who shared it with their coadjutors, or the *secrets*; and thus is probably derived the power of appointing the members of the two hundred, since constantly exercised by the bannerets and *secrets*.

The same charter orders the bannerets to assemble on Whit-Tuesday, in conjunction with the sixty of the preceding year, for the purpose of chusing four members of the sixty from each tribe, who should accompany the bannerets when they convoked the assembly of burghers and inhabitants on St. John's day; and two additional members for convening the assembly of *Secret Sunday*. Here then are six persons from each tribe employed in these convocations, or in all twenty-four persons, the number of members who now form the *secret chamber*. The same charter also enjoins the bannerets and *secrets* to collect the votes in all elections and deliberations; an office which they continue to exercise to this day.

As early as the beginning of the 15th century, the bannerets and *secrets* assembled at Christmas and Easter, for the purpose of preparing and digesting such motions as were to be laid before the Council of two hundred, which adopted, modified, or rejected them.

As the bannerets probably continued to employ the same coadjutors in convoking the assemblies on St. John's day, and on *Secret Sunday*, the *secret chamber*, composed of these twenty-four coadjutors, at length became a permanent body, and enjoys the following prerogatives. 1. It convokes, in conjunction with the bannerets, the people on St. John's day, and the

assembly which meets on *Secret Sunday*. 2. It prepares and draws up all the laws and ordinances; enjoys the sole power of proposing in the Great Council; and by means of the bannerets, of putting a negative on any motion, by affirming it to be contrary to the constitution, without the necessity of proving that it is so. 3. It collects the votes in the election or confirmation of the advoyer, at the meeting of the people on St. John's day, and in the deliberations of the Great Council. 4. It fills up all the vacancies in that Council; 5. Suspends, deposes, confirms, and censures its members; 6. Confirms, or suspends and deposes its own members; makes regulations for the interior administration of its own body; appoints the manner of electing its own members, and filling up the vacancies in the Great Council; 7. Fixes on the time for those elections, and the sum of money which each member is permitted to receive from those who are elected. 8. It can exclude all candidates from being chosen members of the senate, of the sixty, from the office of bailifs, and other important charges; either by refusal to present, or by rejecting them as incapable.

All these prerogatives, founded on authentic documents, or immemorial usage, were confirmed by the Council of two hundred, in 1606, 1623, and particularly in 1716.

All affairs of government, and all debates in the national assemblies, are carried on in the German language; and as the French tongue is spoken in the greatest part of the canton, and particularly by the gentry, there are many members of the Great Council, who do not understand the debates.

Such was the general form of government when I first visited Friburgh in 1776; since that period it has undergone some very important alterations, the substance of which I shall communicate to you in the following letter.

L E T T E R 53.

Origin and Suppression of the late Troubles in the Canton of Friburgh—Changes in the Form of Government.

THE exclusive right of sharing in the administration of affairs, enjoyed by a certain number of families, in the aristocratical cantons, hath, in conjunction with other concurrent circumstances, occasioned revolts in those of Zurich, Berne, and Lucerne, which were quelled by the intervention of the other Helvetic powers, and prevented from again breaking out, by judicious regulations. Friburgh having exhibited a recent example of the same kind; I have endeavoured to trace the origin and progress of those intestine commotions, which have been followed by a considerable alteration in the form of government. Accordingly, I now lay before you the result of my inquiries, impartially drawn from repeated conversations with persons of both parties; from an attentive perusal of several publications written during the course of the troubles; and from some curious manuscripts, which it was my good fortune to obtain.

In the latter end of April 1781, an insurrection suddenly broke out in the bailliage of Gruyeres,

a district in the southern part of the canton; the inhabitants whereof are extremely jealous of their liberties, and zealously attached to all the customs transmitted from their ancestors. Irritated by a few impolitic acts of government, by the petty vexations of the bailiffs; by the secularization of Val Sainte, a convent of Chartreux; by the abolition of several fasts and festivals; and excited by the artifices of Chenaux and Castellaz, two designing leaders, they rose in open rebellion.

Peter Nicholas Chenaux, the chief of the sedition, was a native of la Tour de Treme, in the balliage of Gruyeres. This man was greatly embarrassed in his circumstances, and highly exasperated against government, having been arrested and imprisoned in 1771, for his disobedient and turbulent conduct. He was in the thirty-eighth year of his age, of a good figure and expressive countenance; and, being a man of rude but popular eloquence, and of an overbearing spirit, had obtained a considerable influence over the artless inhabitants. His abettor, John Nicholas Andrew Castellaz, was a burgher of Friburgh and advocate of Gruyeres: versed in all the chicanery of the law, conversant in the history and ancient records of his country, and well acquainted with the privileges of the people, he was the first to expose the slightest oppressions of the bailiff, and to remark wherever government seemed to infringe their immunities, or issued edicts contrary to long-established usages. Having a loud voice, and vehement elocution, he was formed for popular assemblies. He was the person by whom Chenaux was principally directed in all difficult emergencies; he drew up the principal

remonstrances which, exaggerating every defect in the constitution, tended to render government odious, and to spread discontents among the people.

These two leaders having, in conjunction with other accomplices, availed themselves of the public dissatisfaction, and engaged a considerable number of adherents; held, in the month of April 1781, regular meetings at Bulle. On the 24th, in particular, they insinuated before a large assembly, that government had formed a design of imposing additional taxes of a grievous nature, particularly on horned cattle and horses; and even of with-holding the annual present of salt, which they shared with the burghers of Friburgh. They represented, that the secularization of Val Sainte, and the abolition of certain festivals, implied a settled determination to overturn the religion of their ancestors: that the governing party had many enemies; that the despotism of the secret chamber was held in universal abhorrence; that the nobles were discontented, on account of their exclusion from the principal charges of the commonwealth; that the burghers and inhabitants of the twenty-four parishes were jealous of the exorbitant rights possessed by the secret burghers, to whom was exclusively confined the entrance into the great council, and of course into the administration of affairs, and the lucrative offices of government. They added, that the time was now arrived, when they might venture, with impunity, to petition for a redress of grievances; a strong party in the capital was ready, on the first moment of their appearance, to join them; and multitudes would repair from all quarters to the standard of liberty.

Having, by these and similar insinuations, increased the number of their adherents, it was finally concluded, that, on the 3d of May, they should secretly repair to the capital, and, assembling in the market-place, should force the arsenal; that, having provided themselves with arms, they should secure the garrison, and constrain the Great Council to redress their grievances, and make those changes in the constitution, which could alone secure to the people a mild and just administration.

It is sufficiently remarkable, that, notwithstanding the general ferment which prevailed among the people in the bailliage of Gruyeres, and the number of persons concerned in this conspiracy; government received no notice of it, before the 29th or 30th of April. On the first certain news of the intended insurrection, the council of war, who immediately assembled on the occasion, dispatched some troops to arrest Chenaux: but he, having received information from one of his accomplices who happened to be at that time in the capital, escaped to la Tour de Treme; and being joined by the most desperate of his adherents, determined to take arms without delay. Having, by means of his emissaries, excited the spirit of rebellion among the people, who were informed, that Chenaux had narrowly escaped an arrest for his patriotic attempts to secure their immunities; he ventured to repair to Gruyeres, where Castellaz had already collected a considerable party. This advocate, having assembled a large body during the night, expatiated, with much force and eloquence, on the several grievances, using various arguments in

favor of an immediate revolt, similar to those which were urged on the 24th of April. He accordingly inflamed the populace to such a degree, that they flew to arms at five in the morning, and imprisoning the bailif, erected the standard of rebellion. The alarm being now given, Chenaux advanced to Posieux, which was fixed upon for the place of general rendezvous; from whence he addressed a letter to the magistrates of Friburgh, disclaiming all design of having recourse to violence, and requiring only, that the petitions and remonstrances of the people should be taken into consideration.

On the next morning he conducted about sixty of his partisans to a height overlooking Friburgh, with an intention of surprizing the city; but finding the gates shut, the fortifications guarded, and not being joined, as he expected, by the inhabitants of the twenty-four parishes, he retired first to Posieux, and afterwards to Avry, where he expected a reinforcement, which Castellaz and his emissaries were collecting in various parts of the canton.

During these seditious proceedings, the magistrates of Friburgh were active in making preparations for the security of the town. The council of war sat during the whole night; a night of extreme terror and anxiety to many of the inhabitants. The account of the bailif's arrest, of Chenaux's escape, and that he was stationed at Posieux, within two leagues of the capital, with a corps of rebels whose number rumor exaggerated, was no sooner divulged, than a general panic and confusion prevailed. The garrison scarcely consisted of more than fifty

soldiers, and those chiefly invalids; the fortifications were weak and extensive; not more than two hundred burghers could be mustered to defend the ramparts; and the insurgents were supposed to possess a strong party even within the walls. If in this moment of disorder, aggravated by the darkness of the night, Chenaux could have attacked the town with a sufficient force, he might have carried it by assault. But the first emotions of surprise and terror had no sooner subsided, than the besieged assumed a spirit and vigor adequate to the alarming situation of affairs. They all ran to arms; the nobles, burghers, and even strangers crowded to the ramparts, and prepared for a vigorous defence. Their confidence was also raised by the arrival of some militia from Morat, who entered the gates at nine in the morning, and by the expectation of more effectual succours from the canton of Berne.

On the preceding evening a messenger had been dispatched to Berne, requesting immediate assistance. He arrived in that city soon after midnight: the advoyer d'Erlach, in the 85th year of his age, instantly summoned the Sovereign Council. "Gentlemen," exclaimed the venerable magistrate, "on other occasions you have a year to deliberate; you must now instantly act: Friburgh is besieged by an army of rebels; let those who approve sending troops to her relief, hold up their hands." The members unanimously assenting, the assembly broke up; and twelve hundred troops were commanded to march without a moment's delay. Before the close of the evening Major Rihimer entered Friburgh at the head of two hundred soldiers,

who passed unmolested through flying parties of the infurgents; at midnight a hundred and fifty dragoons arrived, and on the next morning eight hundred infantry completed the reinforcement.

The arrival of these troops inspired the magistrates of Friburgh with perfect confidence and security, and saved the town from the most imminent danger. Nevertheless the emissaries of Chenaux and Castellaz, ranging about the country, sounded the church bells in the various towns and parishes, exclaiming that their religion and liberties were threatened with immediate annihilation. The rebel forces were continually augmenting; they began to be joined by many inhabitants in the environs of the town; and the least success would have increased their number. Chenaux had several emissaries within the city, and before mid-day appeared before Friburgh at the head of above two thousand men; eight hundred of whom were provided with muskets, the remainder with only clubs, or the first weapons which chance presented. Having occupied the heights, he found his followers wavering and irresolute, and struck with a general panic on receiving the news, that a large body of troops from Berne had reinforced the garrison. He posted his followers however in an advantageous situation, waiting with considerable anxiety till his forces should be increased, and an opportunity should present itself of commencing hostilities, or of obtaining a general amnesty for himself and his adherents.

In this situation of affairs, Major Rihmer led a detachment of a hundred and eighty dragoons from one of the gates; while lieutenant Froideville,

at the head of seventy foot and twenty dragoons, sallied from another. The Major, driving the besiegers from a height which commanded the town, continued his march with an intent of attacking them in front; and at the distance of about a cannon-shot, reconnoitred eight hundred of the enemy drawn up in order of battle, but without artillery. The insurgents no sooner observed the cannon planted against them, and perceived that the commander was an officer of Berne, than they dispatched repeated messengers to assure him that they had no hostile intentions; that they were only collected to petition for a redress of grievances; and entreated him to spare the effusion of blood. Having received an answer, that he would undertake to intercede in their behalf, if they would instantly lay down their arms, and deliver up Chenaux; they agreed to the first point, but refused the second. The major continued to enforce his demand, and gained time, until lieutenant Froideville appeared unexpectedly in their rear. The two commanders repeating their promises, that their just remonstrances should not be neglected, the whole troop surrendered themselves prisoners. Four of the principal ringleaders being secured, the remainder, having delivered in their names and places of abode, were permitted to retire without molestation.

Chenaux, either finding it impossible to excite his followers to sustain the attack, or being deficient in personal courage, was among the first who betook themselves to flight. Wandering from village to village, he was, about midnight, observed near Posieux by Henry Roslier, one of

his principal accomplices. Roffier, willing to save his own life by betraying his leader, seized him by the collar, reproached him for having seduced the people into rebellion, and for his cowardice in forsaking them; and then, with the assistance of Chavailat and Python, two other insurgents, took from him a double-barelled pistol, and was conducting him to Friburgh. Chenaux, however, suddenly disengaging himself, drew out a knife, and wounding Roffier in several places, endeavoured to escape towards Posieux. But Chavailat pursuing him, and Roffier snatching a musket from one of his followers, soon overtook him, and summoned him to surrender under pain of instant death. Chenaux, finding no hopes of escaping, and deriving courage from despair, attacked Roffier with such inconsiderate fury, that he received the assailant's bayonet in his breast, and expired on the spot.

The death of the leader, the voluntary surrender of his principal associates, and the flight of Castellaz, put an end to this ill-concerted enterprise. Six hundred insurgents, the only remains of the rebels, were on the next morning observed hovering about the capital; but learning the fate of their leader, and the surrender of the other troops, and being attacked by a corps of grenadiers, they dispersed without resistance.

But although the insurrection was thus suppressed, and all parties had concurred in chastising rebellion; yet the spirit of discontent had spread itself with too great violence and rapidity among all ranks of men, not to convince the rulers of the state, that the seeds of the revolt lay deeper

than appearances seemed to suggest. For it was obvious, that the petty vexations of bailifs, the abolition of unnecessary fasts and festivals, and the seeming violation of a few trifling immunities, however exaggerated by the artifices of the most designing leaders, could never have been sufficiently powerful to excite the people of Gruyeres to the desperate extremity of taking arms against their lawful sovereigns; if government had not been extremely unpopular; if several grievances of an oppressive nature had not required to be redressed; several odious restrictions to be removed; and several defects in the constitution to be remedied. Influenced by these considerations, government, in a manifesto issued on the 11th of May, after granting a general amnesty to all the insurgents, excepting a few of the ring-leaders, found it necessary to invite the subjects of all ranks and denominations to present remonstrances, to make representations, and to petition against grievances. About the same time the three cantons of Berne, Lucerne, and Soleure dispatched deputies to Friburgh, offering their mediation towards composing the dissensions of the republic.

In consequence of this manifesto, many petitions and remonstrances were presented to the great council, either claiming the renewal of obsolete rights, the removal of certain restrictions, or the abolition of various taxes; demanding redress of grievances, and an amendment of the constitution; or complaining of an infringement of popular franchises. As it would be needless to mention all the complaints and plans of amendment which were dictated by the spirit of party
and

and the frenzy of innovation, I shall confine myself to three principal points of dispute, which occasioned the most violent altercations; and which would never have been compromised, if the three mediating cantons had not powerfully and effectually interfered: 1. The disqualification of the nobility from the office of bannerets and *secrets*; 2. The exorbitant prerogatives and influence of the *secret chamber*; and 3. The exclusive privileges of the *secret* burghers.

1. With respect to the first point in agitation, it may be remarked, that the exclusion of the noble families from the charge of bannerets and of *secrets* appeared sufficiently reasonable, as long as the government was democratical, and the bannerets were, according to the ancient charters, chosen from the people; and of course when neither they, nor their coadjutors; the *secrets*, could be taken from the nobility. But when the government was changed from a democracy to an aristocracy, and the municipal administration no longer subsisted; and particularly when the troubles excited by the bannerets, in 1553, obliged the Council of two hundred to transfer from the people to themselves the right of appointing those magistrates; the disqualification of the nobility, which was founded on democratical jealousy, ought to have no longer subsisted. Their remonstrances were therefore just, and would have been still more reasonable, if the troubles of the republic had not rendered them dangerous.

2. As to the second point in question: the extensive power and extraordinary influence of the *secret chamber*, could not fail to create jealousies and discontents among all ranks of men.

For, on considering the detail of their prerogatives, as laid down in the preceding letter, it must appear, that although the members of that committee enjoyed no positive authority in enacting or annulling laws; yet by being the depositaries of the constitution, and the ultimate framers of all decrees; by having the sole right of proposing, and a negative on all the resolutions of the great council, no motion could pass without their concurrence. It is also no less obvious, that the power of making regulations for the interior administration of their own affairs, mysteriously concealed from the knowledge of the Sovereign Council, might give rise to dangerous abuses; that the members of the chamber eventually enjoyed, by the power of excluding from all charges, that of nomination; that by appointing to the vacancies in their own body it was to be feared, what in effect happened, that an admission into the *secret chamber* would be chiefly confined to a few families; that, as they filled up all the elections in the Council of two hundred, these elections would depend entirely upon a few persons who possessed the greatest credit; and that thus the government would gradually but necessarily tend to a narrower oligarchy.

3. The third point in debate, namely, the exclusive privileges of the *secret burghers*, opened a much larger and more dangerous field of contention. The demand of the other burghers that, according to the ancient form of government, the right of being elected into the Great Council, and consequently a share in the administration of affairs, instead of being exclusively

confined to the *secret* burghers, should be also extended to them; seemed to militate against the fundamental laws of the republic, and to involve a total change in the very essence of the constitution.

The remaining part of the year was employed in agitating these points of dispute; which gave rise to many political and historical discussions, and occasioned several curious researches into the origin of the *secret chamber*, and the rise of the distinction between the *secret* and other burghers.

For the purpose of ascertaining these questions, the popular party demanded access to the archives; but met with delays and refusals on the part of government, which considered such an inquiry as of dangerous tendency, and calculated to introduce factious innovations in the state.

Exasperated by repeated refusals, the populace began to show signs of discontent, and to assemble in great crowds at the place where Chenaux was put to death: they marched in solemn procession, bearing crosses and colors, and chaunting hymns and *requiems* in honor of this *martyr* (as they called him) to the religion and liberties of his country. These tumultuous meetings would probably have ended in another insurrection, if the bishop of Laufanne had not forbidden them, under pain of excommunication. Towards the conclusion of the year, the deputies from Berne, Lucerne, and Soleure, arrived at Friburgh, for the purpose of composing the differences subsisting in the capital. These deputies, in order to conciliate the burghers, who were no less

violent in favor of the nobles than in extending their own immunities, prevailed upon administration to repeal the disabling clause. With respect, however, to the other subjects of controversy; as they conceived it dangerous to intrust the leaders of a heated populace with the records of government, which might be attended with projects of endless innovation; they proposed, that the Great Council should order a committee to draw up a declaration setting forth the privileges and franchises of the burghers; and that for the future this declaration should be considered as a fundamental code.

But although these essential points were obtained, yet so many subjects of altercation still remained, that for some time all further plans towards finally composing the differences were fruitless. The deputies repaired to Morat, where they were employed, from the 25th of April 1782 to the 25th of July, in hearing appeals, revising and considering the arguments on both sides, and consulting on the best methods to conciliate the two parties.

So greatly however were the burghers dissatisfied with the chiefs of the aristocracy, that they formed a resolution to refuse taking the annual oath of allegiance to the Great Council; nor were they without great difficulty prevailed upon, by the three deputies in person (who repaired to Friburgh for that purpose) to perform the usual homage. Displeased, nevertheless, with the deputies themselves, and considering them as too partial to administration, they delivered a memorial; in which, after representing their grievances, they threatened to appeal to the

general diet of the thirteen cantons assembled at Frauenfeld.

A measure of so alarming a nature, and tending to produce a very material change in the principles of the Helvetic Union, was reprobated in the strongest manner by the members of that confederacy. For it was urged (and with great reason) that by introducing an innovation of such public notoriety, the disputes between the respective governments and their subjects would be liable to become more numerous and dangerous; and that in the end each canton would fall under the guardianship of the remainder. On the other hand, what rendered the present crisis of affairs still more alarming was, that the court of France, consulted by several leading members in administration, had offered her good offices towards composing the dissensions. And although the three cantons had, with consistent dignity, declared against the intervention of any foreign power, and that Friburgh, on accepting such a mediation, should be excluded from the Helvetic Confederacy; yet it was to be apprehended, that on an increase of the troubles, the French would find some pretext to interfere in the affairs of Friburgh, as they were actually engaged in those of Geneva: and "woe upon that republic," said the assertors of Swiss independence, "in whose internal politics foreign powers interpose."

Influenced by these considerations, the three mediating cantons, anxious to bring matters to a speedy conclusion, prevailed upon the ruling party to consent to several alterations in the constitution. At length, after various delays,

disputes, and conferences, the deputies published, on the 19th of June, a manifesto, declaring, that on an impartial and diligent review of the various memorials and manifestos on both sides, the assertions of the burghers were groundless, and their demands unconstitutional; that the present form of government had subsisted above two hundred years; and that the supreme authority resided in the members of the Great Council. To this declaration they added, that the three cantons would defend and protect the existing form of government, and would never permit an appeal relating to the amendment or alteration of the constitution, to any other power than the supreme council of the republic, *that* tribunal being alone competent to such questions.

At the same time they recommended to the government a repeal of the disabling clause, which excluded the nobility from the office of banneret or *secret*; to admit some new families into the *secret* burghership; to hear and redress any remaining grievances; and to correct any defects in the constitution.

This declaration, being accepted by government, was read, on the 28th of July, to the burghers assembled in their respective tribes; but several among them protesting formally against it, the three principal ringleaders of this opposition were banished, their protests disregarded, and tranquillity was restored to the republic.

Soon after this final pacification, the Great Council passed several acts for the redress of grievances, removed some burdens and usages which had been the object of general complaint, and amended the constitution in the following points.

1. A perfect equality is established between the *secret* burghers; the ancient nobles are no longer disqualified from holding the office of bannerets or *secrets*, but do not enjoy any precedence in consequence of their titles, which in all acts and deeds within the canton of Friburgh are omitted. In return, all the *secret* burghers are, without distinction of persons, esteemed equally noble.

2. Sixteen new families have been admitted into the *secret* burghership, which addition nearly completes the number of a hundred families; and it is further enacted, that on the extinction of any three families, an equal number of families shall be elected without delay.

3. The vacancies in the sixty, instead of being indiscriminately supplied from the members of the two hundred at large, are now filled up according to seniority.

4. But the great and principal alteration in the form of government, respects the new constitution of the *secret chamber*; which is changed in the following important points.

1. The members of that committee, instead of being nominated by a majority of voices in their own body, are now taken from the sixty, and chosen by *blind ballot*. The candidates are no longer under the necessity of being presented by a member of the *secret chamber*; but, on addressing themselves to their banneret, the latter is obliged to deliver in their names to the *secret chamber*. As each vacancy is supplied from the particular tribe in which it happens, this alteration must necessarily reduce the candidates to three or four; in order, also, to prevent cabal or corruption, if there shall be only one candidate,

he is not necessarily elected; but it must be decided by lot, whether he shall be chosen or rejected; and if there should be a majority of ballots for the negative, he must wait till the subsequent year, before he can have another chance of being appointed. Each member, on his election, shall pay no more than L. 1. 10 s. to each banneret and *secret*; and the money shall be delivered to the secretary, and by him be equally distributed. 2. Neither father and son, nor two brothers, nor more than two persons bearing the same name, shall be admitted at the same time into the *secret chamber*. 3. The members still retain the right of filling up all the vacancies in the Council of two hundred, with the usual provisions, that the candidates shall be twenty years of age; and that the promotion shall take place every two years. It is further decreed, that on oath, under pain of deprivation, no more than 1200 crowns³ shall be received for the nomination; and that the said sum, instead of being solely appropriated to the person who is to appoint, shall now be delivered to the secretary, to be by him equally distributed among the four bannerets, when either of them shall elect, or among the members of the *secret chamber*, belonging to the tribe in which there is a vacancy, when the turn devolves upon either of them⁴. It is moreover added, that if the person presented

³ Of 25 batz each, the whole sum L. 171. 13 s. 10. d.

⁴ Each banneret to nominate the first vacancy in his own tribe, and then each *secret* by rotation, according to seniority, in his particular tribe.

by a banneret, or a *secret*, shall be rejected by two-thirds of the chamber, another may be presented; but if the second is rejected, the right of presentation shall be transferred to the banneret, or *secret*, next in rank of the same tribe. It is also stipulated on oath, that all promises of changing presentations, or similar engagements, shall not be valid for the future; those only excepted, which are now absolutely subsisting, and which concern either a son of the contracting party, or a person whose name is specified. 4. The power of excluding persons from the principal charges of government, is still reserved to them; but they are exhorted to use it with great precaution and care. 5. The interposition of a negative, exercised by a single banneret, is no longer sufficient to reject a motion in the great council. The opposition, in order to render it valid, must now be founded on a precise law, unanimously approved by the four bannerets: but if one shall dissent, it is then referred to the Council of two hundred, which shall decide, by a majority of two-thirds, whether the negative shall be confirmed or rejected. 6. The power of proposing, formerly vested only in the *secret chamber*, is now extended to the members of the Little Council and the sixty; and the mode of deliberating on such propositions and motions, is attended with forms more or less complicated, as the object is more or less important. In all instances the laws are prepared and finally drawn up by the *secret chamber*. 7. The *secrets* shall take an oath before the bannerets as delegates of the Great Council, to obey all the ordinances of that assembly, and to observe the present articles, without retrenching

or adding to them. And it is further ordered, that no alterations shall be made in the present constitution of the *secret chamber*, unless approved by three-fourths of their own body, and by two-thirds of the Great Council.

L E T T E R 54.

Cheese of Gruyeres—Hermitage near Friburgh.

THE canton of Friburgh contains a small portion of arable land, but abounds in pastures; and, accordingly, its principal articles of exportation consist in horned cattle, cheese, butter, and hides.

The cheese, well known under the name of Gruyeres, which is exported in such large quantities, is made in a chain of mountains about ten leagues in length and four in breadth, extending from the bailliage of Schwartzzenburgh to the districts of Vevay and Aigle in the canton of Berne. All the cheeses, though made in the same manner, are not of the same quality; a difference probably arising from the diversity of the soil, the same plants not growing at all heights; and the lower pastures, called *gites*, being not in such high estimation for their goodness as those in the most elevated situations.

The whole district is divided into greater or lesser farms, which the proprietors let out in leases of three or six years, at the annual rate of 16 s. to L. 1. 10 s. during five months for each cow, according to the nature or elevation

of the ground: the lower pastures, though not of the best quality, are the dearest, because being sooner free from the snow, and later covered with it, they afford food to the cattle for a longer time.

Each farmer, having rented a mountain, hires from the different peasants in the canton from forty to sixty cows, from the 15th of May to the 8th of October: he pays at the rate of from *L.* 1. 6 s. to *L.* 1. 13 s. 6 d. per head; and each cow upon an average yields from twenty to twenty-four quarts of milk per day, and supplies two hundred pounds⁵ of cheese during the five months. On the eighteenth of October the farmer restores the cows to the different proprietors. The cattle are then pastured in the meadows which have been twice mowed, until the 10th or 11th of November, when, on account of the snow, they are usually removed to the stables, and fed during winter on hay and aftergrafs.

As the mountains in the canton of Friburgh afford pasture for at least 15,000 cows, it may be estimated that they annually supply about 30,000 hundred weight of cheese fit for exportation; beside 2,000 or 3,000 on their return from the mountains, exclusive of a thinner sort, which is made in various parts of the canton. The cheeses fit for exportation weigh from forty to sixty pounds each, and are sold from *L.* 1. 17 s. to *L.* 2. per hundred weight. Beside the cows which are pastured during summer in the mountains, the canton contains about 12,000 belonging to the several landholders, which supply their families with milk.

⁵ Each pound contains seventeen ounces and a fraction.

The buildings necessary for making the cheeses consist of a *chalet* or cottage, which contains a room with a furnace for the purpose of boiling the milk, a cellar where the milk is preserved, and a stable for sixty or seventy cows; near it is a kind of dairy-room, kept in an equal degree of temperature, where the cheeses are every day turned and salted. The thickness of the vat, in which each cheese is pressed, is about four inches. The casks for exportation contain ten cheeses, excepting those destined for Italy, which hold only three, in order to be conveyed by mules across the Great St. Bernard. The cheeses well packed up bear the transport into the most distant countries; they ought to be kept in a damp place, and frequently washed with white wine, for the purpose of preserving them from insects. When the cows return from the mountains, a species of cream cheese is made in autumn, and even in winter; it is much esteemed, and is dearer than that of Gruyeres.

The greatest part of the salt used on these occasions is drawn from Franche Comté, a small quantity from Lorraine and Bavaria; but its quality is much inferior. The consumption of the whole canton, for all purposes, is at least 20,000 hundred weight, of which 15,000 is drawn from Franche Comté.

A great number of mares, foals, and horned cattle, are annually raised in the canton: the oxen of three or four years old are sold in the canton of Berne, in the country of Neufchatel, and in Franche Comté. Upon an average it may be estimated that the canton of Friburgh annually supplies pasture for 37,000 cows and oxen.

In our route to Berne, we made a small circuit to the village of Neuneck, in order to see an hermitage, that lies about a league from Friburgh; and which has been highly extolled by travellers on account of its singularity. It is formed in the solid rock; and the chief curiosity consists in its having been the work of two men: as such, it is an astonishing performance, but, in any other respect, is scarcely worth visiting. In the last century a hermit scooped out a hollow in this rock, just sufficient to lie at his full length: but his successor desiring a more commodious mansion, hewed, in the heart of the mountain, a chapel, several apartments, and stair-cases. The length of the whole is above four hundred feet. One room is ninety feet long, and twenty broad; the steeple of the chapel, if it may be so called, is eighty feet high, and the chimney of the kitchen ninety.

The hermit who perforated this dwelling in the rock, was near thirty years engaged in the work. What a waste of time and industry! But such is the folly of sequestered superstition, that, for want of better occupation, it frequently has recourse to laborious trifles. The situation of this hermitage is beautiful: the rock in which it is cut, hangs over the river Sane, which meandering between two chains of hills covered with wood, fills all the valley beneath. The present hermit is a German; and with him lives an old soldier.

From this hermitage to Neuneck (at which place the canton of Berne commences) the country is rich, and finely wooded; on our right we had a distant but sublime view of the most rugged

rocks, the snowy alps rising above them and closing the prospect. The sun was now declining: the various tints of the evening—the purple gleam upon the naked rocks—and the rays of the setting-sun upon the glaciers, which seemed to glow almost into transparency—cast such a beautiful radiance over this magnificent scene, as even the luminous pencil of Apelles himself, who is said to have painted “*quæ pingi non possunt, fulgura et fulgetra*”⁶, would in vain have attempted to imitate.

I am, &c.

LETTER 55.

Town and Canton of Berne.

Berne, Sept. 16.

I WAS very much struck, upon my entrance into Berne, with its singular neatness and beauty. The principal streets are broad and long, not strait, but gently curved: the houses are mostly uniform, built of a greyish stone upon arcades. Through the middle of the streets runs a lively stream of the clearest water, in a stone channel, while several fountains are not less ornamental to the place than beneficial to the inhabitants. The river Aar almost surrounds the town, winding its course over a rocky bed much below the level

⁶ Vid. Plin. H. N. lib. 35. c. 10.

of the streets; and for a considerable way forming by its steep and craggy banks a kind of natural rampart. The cathedral, a noble piece of Gothic architecture, stands upon a platform raised at a great expence from the bed of the river, and commands a most extensive view. The adjacent country is richly cultivated, and agreeably diversified with hills, lawns, wood, and water; the river flows rapidly below, and an abrupt chain of rugged and snow-capt alps bounds the distant horizon. Such an assemblage of wild and beautiful objects would in any place present a most striking prospect; but its effect becomes greatly heightened when seen from the midst of a large town.

According to the native historians, Berne was built by Berchtold the Fifth, duke of Zæringen; and was, from its foundation, an imperial city. Upon the death of Berchtold in 1218, the emperor Frederic the Second conferred upon the inhabitants considerable privileges, and compiled also a code of legislation, which forms the basis of their present civil laws. The liberty which this city enjoyed, attracted many inhabitants from the adjacent country, who found a sure asylum from the oppression of the nobles. Although Berne from its first foundation was engaged in perpetual wars with its neighbours, and for some time with the house of Austria; yet it continued to aggrandize itself by degrees, and considerably to enlarge its territory. In the year 1353, Berne acceded to the Helvetic confederacy; and possessed such great power, even at that early period, as to obtain the second rank among the Swiss cantons. Since the acquisition of the Pays de Vaud,

the domains of this canton form nearly the third part of Switzerland, and about the fourth of the actual population: it contains about 370,000 souls, exclusive of 11,000 in the capital. At the introduction of the reformation in 1528, government acquired a large increase of revenue by secularizing the ecclesiastical possessions. At the same period, the whole canton followed the example of the capital; and the reformed religion was permanently established.

The canton is divided into two great divisions; the Pays de Vaud and the German district. The Pays de Vaud having been conquered from the house of Savoy, and the German district from the states of the empire; justice is administered, and the taxes regulated in those two provinces by laws and customs peculiar to each. Each of these divisions has its treasurer and chamber of appeal resident in the capital: the chamber of appeal belonging to the Pays de Vaud, judges in the last resort; but the inhabitants of the German district may again appeal from theirs to the Sovereign Council.

At Berne the society is extremely agreeable, and foreigners are received with great ease and politeness. The men do not meet in separate societies, and the women are the life and ornament of their daily assemblies. These assemblies begin about four or five in the afternoon, and continue till about eight, when the parties retire to their respective houses.

Dancing is a very frequent amusement at Berne. There is a public ball every fortnight; and in winter scarcely an evening passes without one. These diversions commence at so early an hour
as

as five in the afternoon, on account of a standing order from government, which prohibits their continuance after eleven. English country dances are commonly introduced, but the *walse* (which is a species of allemande) the favorite dance of the natives, is most common. The parties arrange themselves in distinct couples, and follow each other in a circular direction, the gentleman turning his partner with great velocity. The life and spirit of their dances strike a foreigner with astonishment, and can scarcely be conceived by those who have never seen them. The gaiety of these parties is still more enlivened during the summer months, when the natives resort to a garden near the town, and dance under an open pavilion amid scenes of rural festivity. The foreigner who prefers the constant intercourse of company to a more tranquil society, will chuse the residence of Berne rather than that of any other town in Switzerland.

There is but little trade in the capital: some few manufactures indeed (chiefly of linen and silk) have been established; but are carried on by those only, who have no prospect of being admitted into the Sovereign Council. For, those families who enjoy any influence in public affairs, would hold themselves degraded, by engaging in any branch of commerce; and as offices of the state, except bailliages, are in general not very profitable, nor indeed numerous, many of them enter, as their sole resource, into foreign armies. One general advantage, however, is derived from this anti-commercial spirit: the members of government not being interested in laying restrictions on trade, do not, as at Zurich and Basle, confine the exclusive right

of establishing manufactures to the burghers of the capital; but wisely extend that permission to all their subjects, without distinction of rank or place. From this circumstance, in conjunction with the mildness and wisdom of government, arises that comfortable state, and even wealth, which so peculiarly distinguishes the peasantry in the whole canton of Berne; and to the natural result of these wise regulations may be reasonably imputed the attachment to government particularly observable in the German district.

It is worthy of remark, that the peasants, who have acquired opulence either by manufactures or agriculture, seldom quit their situation; they continue in the same habits which they contracted in the earlier period of life, and, however wealthy, never give their daughters in marriage but to persons of their own description.

The public buildings are constructed in a noble simplicity of style, and announce the riches and grandeur of the republic. The arsenal contains arms for sixty thousand men, and a considerable quantity of cannon, which are cast in the town⁷. The granary, an excellent institution, similar to that of Zurich, always contains a large provision

⁷ The pieces of ancient armour which are shown in this arsenal; and in which the national militia, to whom Switzerland owes its freedom were formerly clothed, are much too small for its actual inhabitants. The only people of the canton, whom this armour will fit are the highlanders of the Southern districts. It is singular, that the degradation of the human species, should, instead of occasioning a diminution of size, in certain circumstances, rather appear by an increase in the stature. This small armour is, however, exceedingly heavy, and the swords as well as pikes of a monstrous length. RAMOND,

of corn, supplied in consequence of particular treaties by France and Holland.

The charitable institutions of Berne are numerous, liberal, and well directed. The hospitals are in general large, clean, and airy; and, in the alms-house for the reception of fifty poor citizens, is a curious establishment similar to one which I noticed at Basle. Distressed travellers are treated with a meal and a lodging, if at night, and receive six-pence on their departure. If sick or wounded, they are maintained till their recovery is established.

The house of correction, which, when the benevolent Mr. Howard visited Berne, was in so deplorable a state, is now extremely well regulated, and reflects great honor on Mr. Manuel, member of the Great Council, to whose care and attention this salutary change is chiefly owing. Formerly all delinquents, without distinction of crime, were confined in the same place; but they are now separated; and two houses are established; one called the House of Correction for greater crimes, and the other the House of Labor for smaller misdemeanors. The prisoners are also discriminated by the appellations of *brown* and *blue* from the color of their clothes, with which they are supplied gratis during the term of their confinement. The brown color is appropriated to the house of correction, the blue to the house of labor. The men and women are lodged in separate apartments. Both are constantly employed, sometimes in cleaning the streets, and other servile occupations; at other times they are taught to read and write, and are instructed in various trades, which may assist them in gaining

a maintenance at the expiration of the time for which they were sentenced to hard labor. By these means the expense of the establishment is nearly supported; and a honest livelihood assured to those who would otherwise prove useless or pernicious members of society.

There are four tables, at which the respective seats are a mark of distinction appropriated to good behaviour, and a larger or lesser share of provision is distributed to each in proportion to their industry. After having earned their food, the prisoners in the house of labor receive ten per cent. those in the house of correction eight per cent. for their extra work.

Public justice is wisely and impartially administered; and the torture, which had for some time fallen into disuse, is now formally abolished by a public act of government. This humane and just act forms a distinguished era in the history of Swiss jurisprudence; as the example of so powerful and wise a government cannot fail producing a general influence; and it is to be hoped, will be the prelude to its abolition throughout Switzerland.

The solemnity used in passing capital sentence on a criminal, deserves to be mentioned and imitated. The trial being finished, the prisoner is informed of his condemnation by the *Grand Sautier*, or lieutenant of the police, and attended by two clergymen, who prepare him for death. On the day appointed for execution, a large scaffolding, covered with a black canopy, is constructed in the middle of the principal street. The advoyer, with a sceptre in his hand, is seated on an elevated kind of throne between two

senators, and attended by the chancellor and the lieutenant of the police, holding an iron stick, called the *rod of blood*, all habited in their official robes. The criminal being brought to the foot of the scaffolding without chains, the chancellor reads aloud the sentence of condemnation, at the conclusion of which the advoyer bids the executioner approach. The latter instantly binds the arms of the culprit, and leads him to the place of execution.

The public library is a small but well-chosen collection, and contains 20,000 volumes, a cabinet of Swiss coins and medals, and many curious manuscripts: of these, Mr. Sinner, a man of great erudition, has published a judicious catalogue. He has not only set forth their titles, and ascertained their age, but has also given a general and succinct account of their respective subjects; and from many has published extracts equally curious and interesting. Among these MSS. are some of the thirteenth century, consisting of several songs and romances of the Troubadours, written in that and the preceding ages, which merit the attention of those who are conversant in that species of ancient poetry.

Learning is neither so universally encouraged, nor so successfully cultivated here as at Zurich; the academical studies are almost solely directed to those branches of knowledge more essentially necessary for entering into the church. The society for the promotion of agriculture, is almost the only establishment that directly tends to the progress of the arts and sciences; and meets with no great countenance from government.

P O S T S C R I P T.

October 1786.

I FEEL a very sensible satisfaction on adding, that this enlightened government no longer merits the reproach of not sufficiently encouraging the arts and sciences. It is now awakened from its former lethargy, and begins to perceive that it is the interest of every wise government to esteem and protect the sciences. The magistrates have lately purchased and appropriated a large mansion for the public library; increased the collection of books; and produced from England an extensive apparatus of experimental philosophy.

Among other undertakings which meet with their encouragement, a new map of the canton is now preparing under their auspices, by the professor of experimental philosophy, a great *desideratum* in the geography of Switzerland, as the alps of the canton are unfaithfully delineated in all the maps which have fallen under my observation. I am also happy to add, that the Reverend Mr. Wyttenbach has lately instituted a literary society for the promotion of physics and natural history in general, and that of Switzerland in particular. In January 1788, this society consisted of ten members resident at Berne, of whom several possess, and others are forming, collections agreeable to the plan of the institution. The members have established regular correspondence in various parts of Europe, and are ready to answer the inquiries of foreign naturalists, who wish to be informed concerning any points

which relate to the natural history of this country. An institution founded on such liberal and extensive principles, and having one object principally in view, cannot fail to render the most essential service to science.

I am, &c.

L E T T E R 56.

Government of Berne.

WERE I to attempt entering into an exact disquisition concerning the government of Berne; my letter would not only exceed its proper limits, but would hardly be contained within the extent of an ordinary pamphlet. I am persuaded, therefore, you will readily excuse me from putting your patience to so tedious a trial: but you would probably think me very inconsistent indeed, if, after having already descended into less interesting details, I should pass over in silence a government, the wisdom of whose administration is so justly admired. Let me endeavour then to sketch the general outlines of this constitution.

The sovereign power resides in the Great Council of two hundred; which when complete consists of two hundred and ninety-nine members, chosen from the citizens; from whom they are considered as deriving their power, and as acting by deputation. The authority with which they are invested, is in some respects the most absolute and uncontrouled of any among the

aristocratical states of Switzerland. The government of Lucerne is called, indeed, the most aristocratical of all the cantons; and it may be so; perhaps, with respect to the small number of families, to which the administration of affairs is intrusted: but no war can be declared, no peace concluded, no alliance made, no taxes imposed, without the consent of the burghers in a general assembly. At Friburgh and Soleure the burghers are likewise convened upon particular occasions. Whereas the Great Council of Berne, since 1682, when it was declared the sovereign, is restrained by no constitutional check of this kind; as a general assembly of the citizens is never convened on any occasion.

The executive powers of government are delegated by this Sovereign Council to the senate, chosen by themselves from their own body: the former assembles ordinarily three times a week, and extraordinarily upon particular occasions; the senate every day, Sundays excepted.

The senate, comprising the two advoyers, or chiefs of the republic, is composed of twenty-seven members; and from this select body are drawn the principal magistrates of the commonwealth. On a vacancy in the senate, the mode of election is as follows:—Twenty-six balls, three of which are golden, are put into a box, and drawn by the several members: those who draw the three golden balls, nominate three electors out of their body. In the same manner of balloting, seven members are chosen from the Great Council, who also nominate seven electors out of their own body. These ten electors fix upon a certain number of candidates, not exceeding

ten, nor less than six; and those among these candidates, who have the fewest votes in the Sovereign Council, retire, till their number is reduced to four: then four balls, two golden and two silver, are drawn by the four remaining candidates; the two who draw the former are put in nomination, and he who has the greatest number of suffrages in the Sovereign Council, is chosen. But in order to be eligible, the candidate must have been a member of the Great Council ten years, and must be married, or a widower.

The Great Council is generally filled up every ten years; as within that period there is usually a deficiency of eighty members to complete the whole number of two hundred and ninety-nine: a new election can only be proposed on a vacancy of eighty; and cannot be deferred when there is a deficiency of a hundred. The time of election being determined by vote, each advoyer nominates two of the new members; each seizenier, and each member of the senate, one each: two or three other officers of state enjoy the same privilege. A few persons also claim, by virtue of their offices, a right of being elected: and their claim is generally admitted. These several nominations and pretensions, commonly amount, in the whole, to about fifty of the new members: the remaining vacancies are supplied by the suffrages of the senate, and the seizeniers.

The *Seizeniers* are sixteen members of the Great Council, drawn yearly from the abbayes or tribes; two from each of the four great tribes, and one from each of the remaining eight. The

candidates are generally ⁸ taken from those who have exercised the office of bailifs; and are elected by lot. Every year during three days at Easter, all other employments in the state are suspended, except those of the bannerets and the seizeniers, who, during this suspension, are invested with a power similar to that of the Roman cenfors. In case of mal-administration, they may remove any member from the Great Council, or from the Senate: but it is a power which they never exercise; and should they think proper to exert it, the sentence must be confirmed by that council.

The principal magistrates are, two advoyers, the two treasurers, and the four bannerets: they are each of them chosen by a majority of voices in the Sovereign Council, and are yearly confirmed in their respective offices⁹. The advoyers

⁸ I say *generally*, because it is not absolutely fixed, that all the seizeniers must have been bailifs: for if it happens, that in one tribe there are two persons, one of whom has been a bailif, and the other is a member of the Great Council; they draw lots for the charge. And should a member of the Great Council be the only one of his tribe, he becomes seizenier of course, provided he is eligible. In order to be seizenier, the candidate must be married, or a widower, and have neither his father or brother in the senate.

⁹ The advoyer can only be elected from among the bannerets and the treasurers. The bannerets are the heads of the four divisions of the army of Berne; they are chosen out of those citizens who form the four first abbayes or corporations. These four companies are those of the smiths, the tanners, the bakers, and the butchers; they are the oldest, and enjoy very considerable privileges. The members of these corporations need not exercise their trade; but

hold their post for life; the treasurers, six years; and the bannerets, four. At Easter the advoyer in office delivers up his authority, in full council, to his colleague. The *reigning* advoyer sits on an elevated seat, under a canopy, and the seal of the republic lies upon the table before him. He never delivers his opinion except it is demanded; he enjoys no vote unless the numbers are equal; and in that case, he has the casting voice. The advoyer out of office, is the first senator in rank, and president of the secret council.

The two treasurers, one for the German district, and the other for the Pays de Vaud, form, in conjunction with the four bannerets, an æconomical chamber, or council of finances: this council examines and passes the accounts of the bailifs, and receives the revenues of all those who are accountable to government. The four bannerets, together with the advoyer out of office, the senior treasurer, and two members of the senate, compose a committee or secret council; in which all state affairs, that require secrecy, are discussed.

I have only described these eight magistracies, as being the chief offices of the state, and exercised by members of the Senate. But although the general form of this constitution is entirely aristocratical; and the Senate possesses a very considerable influence; yet it does not enjoy that whenever they will pass from one into another, they must make a master-piece, or exhibit a specimen of their capacity. A branch of the house of *Erlach*, that had been excluded from the offices of state, being no member of one of the first corporations, was admitted into that of the smiths.

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almost exclusive authority, which is observable in many aristocratical governments. For, by several wise and well-observed regulations, the Sovereign Council, although it delegates the most important concerns of government to the Senate, yet assembles, at stated times, and superintends the administration of public affairs.

It may also be remarked, that although the ancient houses retain very considerable influence, and are more readily intrusted with the administration of affairs; yet that the principal charges of government are not exclusively confined to them; many new families being always admitted into the Sovereign Council on every election. It must nevertheless be acknowledged, that, as the citizens are continually diminishing, and their vacancies are never supplied; it would well become so wise a government to receive occasionally new families into the burghership, in order to prevent the ill effects arising from the partial and narrow spirit of too confined an oligarchy. Government is administered throughout its several departments with great precision, and every ordinance is executed with as much dispatch as in a monarchical state. The administration of affairs is carried on with great wisdom and moderation, and the rulers are particularly cautious not to encroach upon the privileges of the subject.

The canton of Berne is divided into a certain number of districts, called bailliages; over which, bailifs are chosen from the Sovereign Council: and, these posts being the most profitable in the disposal of government, are the great objects of general pursuit. Formerly the bailifs,

taken indifferently from the Senate or Great Council, were nominated by the bannerets; but as this method rendered the members entirely dependent upon those who had the chief credit and influence in the commonwealth; the mode of election was altered in 1712, and they are now chosen by lot. No competitor, however, can be received as a candidate, in opposition to a more ancient member of the Great Council: for instance, he who was admitted in 1766, cannot stand against one who was chosen in 1756. None but married men or widowers are capable of being elected into this office; nor can any person occupy more than once the principal bailiages: those of a less valuable kind may be possessed three times.

The several bailifs are representatives of the sovereign power in their respective districts. They enforce the edicts of government, collect the public revenues, act as justices of the peace, and are judges in civil and criminal causes, except where there is any local¹ jurisdiction. In civil causes, beyond a certain value, an appeal lies to the courts of Berne: in criminal affairs, the process is made out in the bailif's court, undergoes a revision in the senate, and is referred to the criminal chamber, which inflicts punishment for small misdemeanors. In capital cases, the sentence must be confirmed by the Senate, and by the Sovereign Council, if the delinquent is a citizen of Berne. The bailif delivers his accounts to the œconomical chamber, to which

¹ The lord of the estate of Diesbach enjoys, within his own lands, the same powers, in criminal affairs, as are possessed by the bailifs in their respective districts.

court an appeal lies, in case of exaction, either on the part of the bailif, or of his officers: and with respect to those misdemeanors that are punishable by fine, and of which the bailif is entitled to a share; the proportion of the respective penalties is settled by the legislature with the most scrupulous exactness, and not left to the arbitrary decision of an interested judge.

Although from all these considerations it should seem, that every possible precaution has been taken by government to prevent the extortions of the bailifs; yet instances have not been wanting to prove, that these wise and strict regulations may be eluded: but it is no less certain, that where bailifs have been guilty of oppressions, frequent examples occur of their being impartially and severely punished.

The profits of this office arise from the produce of the demesnes, of the tithes, and certain duties paid to government in the respective bailiages. In some parts of the German division, the bailif is entitled, upon the death of every peasant, to a determinate part of the inheritance: although his share is very inconsiderable, yet in some situations it may prove an oppressive tax upon the family. This tax is the only instance that has fallen under my knowledge, where the peasants of this canton are liable to any imposition, which can justly be deemed grievous.

Although there are no standing armies in Switzerland; yet in many of the cantons, and particularly in Berne, the militia is so well regulated, that government could assemble a very considerable body of men at a moment's warning. To this end, every male at the age of sixteen

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is enrolled in the militia; and about a third of the whole number are formed into particular regiments, composed of fusileers and electionaries; the former consisting of bachelors, and the latter of married men. Every person thus enrolled, is obliged to provide himself, at his own expense, with an uniform, a musket, and a certain quantity of powder and ball: and no peasant is allowed to marry, unless he produces his uniform and arms. Every year a certain number of officers, who are called Land Majors, are deputed by the council of war, throughout the canton, to inspect the arms of the soldiers; to complete the regiments, and exercise the militia: upon their return they make their report to that council. Beside this annual review, the regiments are occasionally exercised by veteran soldiers, appointed for that purpose.

Beside the arms in the arsenal of Berne, a certain quantity is also provided, in the arsenal of each bailliage, sufficient for the militia of that district; and likewise a sum of money amounting to three months pay, which is appropriated to the electionaries in case of actual service. The dragoons are chosen from the substantial farmers; as each person is obliged to provide his horse and accoutrements. In time of peace, the advoyer out of office, is president of the council of war, and a member of that council is commander of the militia in the Pays de Vauds; but during war a general in chief is nominated, who commands the forces of the republic.

A certain number of regiments being thus always in readiness, signals are fixed on the highest

part of each bailliage, for assembling the militia at a particular place in each district; where they receive orders for marching.

Before I close this letter, I shall just mention an institution called the *Exterior State*, as remarkable for its singularity as its utility. It is a model of the Sovereign Council, and is composed of those burghers, who have not attained the age requisite for entering into that Council. It has a Great Council, a Senate, two advoyers, treasurers, bannerets, and seizeniers; all of whom are chosen in the usual manner, and with the accustomed ceremonies. The post of advoyer in this mimic community is solicited with great assiduity, and sometimes obtained at a considerable expense; as the successful candidate is always admitted into the Great Council, without any farther recommendation. This body possesses a certain number of bailliages, which consist of several ruined castles dispersed over the canton: it has also its common treasure, and its debts. In this latter article, however, it by no means resembles the actual government of Berne, which is not only free from debts, but possessed of a very considerable fund in reserve.

This remarkable institution, may be considered as a political seminary for the youth of Berne. It renders them acquainted with the forms of the constitution; and, as the members debate upon all kinds of political subjects, affords them an opportunity of exercising and improving their talents, and by that means of becoming more capable of serving the public, whenever they may be admitted to a share in the administration of government.

I am, &c.

LETTER

L E T T E R 57.

Biographical and Literary Anecdotes of Haller.

BERNE has produced few men highly eminent in literature; but has established her glory in being the birth-place of the celebrated Haller.

Albert Haller², the youngest of five brothers, was born on the 16th of October 1708. His

² The materials for this biographical sketch, are chiefly collected from the following lives of this great man, which, as I was informed, by his eldest son, since deceased, are those to which most credit may be given. 1. *Leben des Herrn von Haller*, by George Zimmerman. Zurich, 1755. The author was the disciple and friend of Haller. 2. *Lobrede auf Herrn Albrecht von Haller, von Herrn Balthasar*. Basel, 1778. The author was Haller's intimate friend, and was well acquainted with the principal events of his life. He is the same gentleman whom I have mentioned in vol. I. Letter 23. 3. *Lobrede auf Herrn Albert Haller*. Durch V. B. Tscharner des Grossen Raths, &c. Berne. 1778. Mr. Tscharner, being a native of Berne, and an intimate acquaintance of Haller, his account deserves implicit credit. He was author of several esteemed works on the topography and history of Switzerland. He died in 1778, a short time after he had pronounced this panegyric on his deceased friend. *Eloge Historique d'Albert de Haller, avec un Catalogue de ses Oeuvres*. Geneve, 1778. Sennebier, the writer of this eulogium, is well known as the learned author of *Bibliothèque de Geneve*, and of *Histoire Littéraire de Geneve*. He informs us, that he had received several anecdotes from the family of Haller.

Many other panegyrics and lives of Haller have been published in various parts of Europe; but as they were mostly written by those who were not personally acquainted with him, I have not cited them as authorities. His son mentions nineteen lives and panegyrics of his father, that had fallen under his notice in 1784. See *Bibl. Schweit. Geschic.* vol. ii.

father, Emanuel Haller, a citizen of Berne, practised the law as an advocate with great success; and in 1713, removed from the capital to Baden, where he was appointed secretary of that bailliage.

Although many accounts are usually related concerning the early genius of distinguished persons, which do not always deserve implicit credit; yet the premature abilities and application of Haller are incontestably proved. When he had scarcely attained his fifth year he was accustomed to write the new words, which he recollected to have heard in the course of the day. His progress in the languages was so rapid, that in his tenth year he could translate from the Greek, and composed for his own private use a Chaldaic grammar, a Greek and Hebrew lexicon. His passion for letters was also so general and ardent, that, about the same period, he abridged from Bayle and Moreri an historical dictionary, comprising above two thousand lives, and distinguished himself by a satire in Latin verse against his preceptor Abraham Baillod, a person of considerable learning, but of a capricious and morose disposition.

Such unwearied application, and such astonishing progress, in a youth of his years, ought to have ensured the approbation and encouragement

N^o 882—906. I have been enabled to add several anecdotes which I procured at Berne, and from his eldest son the late bailif of Nyon.

The completest list of Haller's works is to be found in the 6th volume of "*Epistolæ ad Hallerum scriptæ*." Berne, 1775. His subsequent publications may be supplied from Sennebier's catalogue,

of his family. On the contrary, his father, who had destined him to the law, reproved his growing taste for polite literature, was particularly offended at his inclination for poetry, as likely to draw him from the severer occupations, and objected to the variety of his pursuits as too desultory and superficial. He did not consider, that, during childhood, the principal requisite of education is to infuse a taste for application in general; and, that when the base of education is rendered as broad as possible, it may always, like a pyramid, be reduced to a point. But neither his father's repeated exhortations, nor his preceptor's severe admonitions, could oblige the youth to confine his studies to one object, or check his insatiable thirst for general information.

In this manner he was educated until 1721, when, on his father's death, he was removed to the public school at Berne. He was placed in a class far above his age; and usually wrote in Greek the exercise, which he was expected to compose in the Latin tongue.

In 1723, he obtained permission to accompany a young friend to Bienne, in order to be instructed in philosophy by the father of his companion, who was a celebrated physician. But his new preceptor being a bigot to the Cartesian school, Haller soon rejected with disdain that logic and philosophy, which tended to cramp his genius rather than extend his knowledge; and continued to cultivate history, poetry, and polite literature, but with as little order and method as might be expected from his years.

Haller, during his residence at Bienne, began a custom, which he afterwards followed through

life, that of writing his opinion of the books which he perused, and making large extracts from them. His genius being also awakened by the romantic scenery of the country to poetical enthusiasm, he composed various pieces in the epic, dramatic, and lyric styles. He was at this time so entirely absorbed in this favorite study, that, on a fire breaking out in the house in which he resided, he rushed into his apartment, and rescued his poetry from the flames, leaving his other papers, with little regret, to destruction. Afterwards, when a more mature age had ripened his judgment, he was frequently heard to say, that he had preserved from the flames those compositions which he then thought the finest productions of human genius, in order at a future period to consign them to destruction as unworthy of his pen³.

In this period of life, Haller compares himself to a wild plant, which is left to grow without

³ Many of his biographers have confounded these two facts; and, from a natural proneness to exaggeration, have asserted, that at Bienne, Haller, with a greatness of mind above his years, burned his poetical compositions, from a strong conviction, that poetry tended to alienate his mind from the severer studies: whereas, the very contrary happened. He saved his poetical pieces in preference to his other papers, and burned them afterwards, because they would have disgraced his reputation: although, as juvenile productions, they were not wholly without merit. I have in this instance preferred the authority of his particular friends; Balthasar and Tscharner, to his other biographers, who had not such opportunities of obtaining the truth. Besides, as a confirmation of their evidence, Haller did not intermit his poetical studies; and wrote at Tubingen his *Morgen-Gedanken* and *Sehn-Sucht*, which are the earliest specimens he ever gave to the public.

pruning; and this very circumstance was probably the principal cause of his future proficiency, and the foundation of that universal knowledge, to which he afterwards attained.

He had been originally intended for the law: but his active mind could not submit to follow a profession which would limit his inquiries; which entirely depended on precedent and authority; and which, to use his own quotation from Horace, in a letter to his friend Bonnet, obliged him,

Jurare in verba magistri.

And although he could not submit to the shackles of that narrow philosophy, so strongly recommended and enforced by his new preceptor, yet he appears to have been principally determined by his advice to dedicate himself to physic; the study of which comprehends such a variety of literary pursuits, as seemed congenial to the zeal and activity of his capacious mind. He had no sooner formed this resolution, than he adopted a more regular and uniform plan, than he had hitherto been able to pursue. For this purpose he removed, towards the end of 1723, to the university of Tubingen, where he prosecuted his studies with that unwearied application, which never forsook him, under the professors Elias Camerarius and du Vernoy. From Camerarius he learned those sound principles of rational philosophy, which teach us first to doubt, and afterwards to believe; and which are as far removed from credulity on one hand, as from scepticism on the other. From the lectures of Du

Vernoy he imbibed his first taste for botany, and made so rapid a progress in the study of anatomy, that his master predicted, from several dissertations, his future proficiency in that line. Notwithstanding, however, his strong and invariable attachment to these two branches of natural history, he represents himself as studying *invitâ Minervâ*, against nature; anatomy though he could not support bad smells, and botany though he was extremely short-sighted. At Tubingen he also distinguished his knowledge in mineralogy by refuting the error of Tournefort, in ascribing to fossils a vegetating power.

During his continuance in that university, he gave an instance of his early control over his passions; a difficult conquest for a young man of strong feelings and lively imagination. A single deviation into excess, into which he had been hurried by the example of some of his fellow-pupils, so greatly affected a person like him, no less enamoured of virtue, than susceptible of ingenuous shame, that he instantly formed a resolution to abstain from wine; and adopted a strictness of morals, which renders highly probable the assertion of his French encomiast, the Marquis de Condorcet, that he was descended from a family, in which piety might be said to be hereditary.

In 1725, Haller repaired to Leyden, to which place he was drawn by the great reputation of Boerhaave. Here he found a more ample field for a display of his abilities, and the improvement of his mind. He became the favorite scholar of Boerhaave, by whose example and

encouragement he firengthened his growing inclination for botany. He noted down his master's lectures on the *Institutes of Medicine* with such precision, as afterwards gave birth to one of his most useful publications. He continued his anatomical studies under Albinus, just then rising into fame, and the venerable Ruysch, who so highly improved the art of injecting anatomical preparations.

The precarious state of his health, probably occasioned, or at least increased, by his intense application, induced him to accompany two of his countrymen through part of Germany. On his return, in 1726, he received his doctor's degree, though only in the nineteenth year of his age; and published on that occasion his inaugural dissertation *de Ductu salivari Coschwiziano*.

In 1727 he visited England, was favorably received by Cheselden, Douglas; and Sir Hans Sloane; and improved his knowledge of medicine and surgery under the auspices of those celebrated men, and by diligently attending the hospitals.

At Paris, whither he next directed his course, he studied botany under Geoffroy and Jussieu; anatomy under Le Dran and Winslow, a celebrated surgeon. Winslow was indeed his favorite master, to whom he particularly attached himself; whom he proposed to his disciples as the best model for their imitation, as an anatomist, who, shackled by no system, described simply and faithfully what he himself observed in his dissections.

Haller had proposed to continue his travels to Italy, that country where medicinal knowledge

first revived in the darker ages, and where,

“ Smit with the love of sacred song ,”

he might indulge his enthusiasm and improve his taste in classical literature. The uncertain state of his health, the *maladie du pays* which so remarkably affects the Swiss in foreign parts, and on which he has composed a poem, together with the advice of his friends, prevailed over his inclination, and induced him to return to his native country.

In his way to Berne he stopped at Basle, in order to study mathematics and algebra under the celebrated John Bernoulli; and in this, as well as every other instance of his life, applied with such indefatigable perseverance, as if those sciences were to form the sole object of his future researches. His proficiency in these studies is sufficiently proved by several treatises still extant in manuscript, which he composed on arithmetic and geometry, and particularly by his remarks on the Marquis de l'Hospital's Analysis of Infinitesimals; and his attachment to them by his being deeply employed in a profound calculation on the day of his marriage. But though he made such a progress as astonished Bernoulli himself, he continued his other pursuits, being appointed to read lectures on anatomy during the sickness of the professor: while he fulfilled the duties of that office, he also attended the lectures of Tzinger on the practical parts of medicine; thus at the same time displaying, with equal propriety, the dignity of a professor, and the humility of a pupil.

During the summer of 1729, he in company with his friend John Gefner, made an excursion into the mountains of Switzerland; an excursion rendered memorable by its suggesting to him the plan of a *Flora Helvetica*, and by inspiring his poem on the Alps, which he composed in the 21st year of his age; a poem as sublime and immortal as the mountains which are the subject of his song.

Not to interrupt these biographical anecdotes with a chronological detail of his poetical productions, I shall just mention, that, not long after his poem on the Alps, he wrote his ethic epistles, on the Imperfection of Human Virtue, on Superstition and Infidelity, on the Origin of Evil, on the Vanity of Honor, Various Satires, Doris, a Pastoral on his first wife, and his much admired Elegy on her death. It is a convincing proof of Haller's versatile genius and extraordinary mental powers, that he should have so eminently excelled in poetry, which, except in his early youth, he never considered otherwise than as an amusement, either to sooth him under afflictions, and in the bed of sickness, or to console him for the envy and neglect of his contemporaries.

The soundest German critics place Haller among the most eminent of their poets; and consider sublimity as the grand characteristic of his writings. They acknowledge, that he improved the harmony and richness of his native tongue; that he possessed the highest powers of invention and fancy; great originality both in his ideas and language; that he is the true colorist of nature; that he sounded the depths of metaphysical and moral science; that he equally excels in

picturesque descriptions, in soft and delightful imagery, in elevated sentiments, and philosophical precision. A few supercilious critics have reproached his poetry with occasional obscurities; and accuse him of having introduced a new language affectedly averse to the common modes of diction. Cold criticism may censure; but twenty-two successive editions of his German poems, and the translation of them into the principal languages of Europe, prove, that they possess the great aim of poetry, that of pleasing and interesting the reader. And it may be remarked with truth, that although Haller's stupendous labors in erudition and science render his poetical talents of inferior account; yet that if he had confined himself to poetry, that alone would have immortalized his name.

But it is time to follow Haller to his native city, where he returned, in 1729, expecting from his countrymen that respect and patronage, he had so liberally received abroad. He had, however, the mortification to experience that neglect, and even envy, to which every man of genius is exposed in his own country, and which he seems to have augmented by his satirical compositions.

He continued three years without having the interest to procure any public employment; and, though he prevailed on Government to establish an anatomical theatre, and gave lectures gratis; yet he did not succeed in obtaining the place of physician to the hospital, which he much desired. He also solicited a professorship, and was again repulsed. He seems to have sensibly felt these disappointments, and expressed his impatience and indignation in his satirical poems. Instead,

however, of damping his activity or abating the ardor of his genius, he redoubled his application and services in order to force himself into public notice.

The first distinguishing tribute to his literary talents was paid by the Royal Society of Upsala, which, in 1735, chose him a member. This election was the prelude to more honorable and beneficial employments. In the same year his countrymen at length acknowledged his merit, by appointing him director of an hospital and public librarian. In the former situation he distinguished himself by his zeal and humanity; in the latter, he bestowed great pains in arranging the library, and in forming the first catalogue. Scarcely any branch of literature, however remote from his usual occupations, was omitted by Haller, whenever an opportunity presented itself, either of improving his general knowledge, or of being useful to science. Finding in the public library a collection of ancient medals, which had been hitherto neglected; he took considerable pleasure in classing them. His love of history led him to pay great attention to the study of medals, which he justly considered as the most authentic documents of historical truth, and the most certain monuments to ascertain the ever-fluctuating state of language.

His literary reputation began now to spread itself by various botanical, anatomical, and medical publications, and by a collection of poems⁴, which first made its appearance in 1732.

⁴ *Versuch Schweitzerischer Gedichte.* The best edition is printed at Berne, 1775.

At length, in 1736, he received, unsolicited on his part, the offer of the professorship of physic, botany, and surgery, in the university of Gottingen, newly established by George the Second. Notwithstanding, however, all the advantages and honors which accompanied this offer, he, for some time, hesitated whether he should accept it. He had, in 1731, espoused a young lady of good family whose great beauty and accomplishments were rendered still more endearing by her affectionate subserviency to his manner of life. She had brought him three children; and these ties attached him more strongly to his native place, where his merits had procured him many sincere friends; and the air of which he considered as in some respect necessary for the continuance of his health. On the contrary, the honor of being invited by so great a monarch, the dignity of the establishment to which he was called, and the consideration of having a more ample theatre for the improvement of his knowledge, induced him to remove to Gottingen.

He quitted, however, Berne with much regret; presaging, as it were, the heavy stroke which overtook him soon after his arrival in that university. He lost his wife. The death of his beloved Marianne, whose memory he has celebrated in a pathetic elegy, afflicted him so deeply, that it almost brought him to the grave. In this crisis of despondency he redoubled his application, as the most probable means of subduing his sorrow; and the duties of his station forced him from the contemplation of his own grief into public life.

During seventeen years, in which he resided at Gottingen, where his abilities expanded in proportion as his opportunities of acquiring knowledge increased; he obtained from government the establishment of a botanical garden, which he superintended, of an anatomical theatre, a school for midwifery, and a college for the improvement of surgery. He formed the plan for a Royal Society of Sciences, of which he was appointed perpetual president.

The comprehensive mind and versatile genius of Haller, united with his unremitting diligence and ardor in all his pursuits, enabled him to cultivate with uncommon success a variety of knowledge. Had not the great Swede pre-occupied the field, it is probable, that Haller would have stood the first among his contemporaries as an improver of botanical knowledge⁵. Yet botany was not among his earliest pursuits, for he informs us, that he had made no advances in it until his return from his travels: during his residence at Basle, in the year 1728, as if inspired, he says, by the genius of that place, which had nurtured the Bauhins, and where at that period botany was successfully cultivated by Stæhlin, he laid the design of his future Flora. From this time he made annual journeys into various parts of Switzerland, and principally among the Alps. He cultivated the correspondence of the most eminent botanists; particularly with Scheuchzer, Ludwig, Linnæus, van Royen, and Dr. John Gesner of

⁵ I should not have presumed to have given any detailed account of Haller's botanical, medical, or anatomical works, if I had not received assistance on these subjects from my very judicious friend Dr. Pulteney.

Zuric, who had also meditated a design to publish a Swiss Flora, and freely communicated his materials to Haller.

His establishment at Gottingen afterwards enlarged his views and opportunities; and at length, in 1742, his great botanical work on the plants of Switzerland, the result of fourteen years study, made its appearance. It was entitled, *Eumeratio Methodica Stirpium Helvetiæ*, in 2 vols. folio. It was the most copious Flora the world had ever seen, comprising 1,840 species, and was enriched with several advantages, that rendered it singularly acceptable. The preface contains a compendious geographical description of Switzerland, and of the Alps particularly, an account of all the authors who had written on the plants of that country; the recital of his own journies; acknowledgments to those who had assisted him; concluding with the order and method he means to pursue in this work.

After the preface follows a chronological account of 268 volumes, which he cites in the work, each accompanied by a general character; in which, with great candor and impartiality, he points out the merit or demerit of the author, in the manner which he afterwards pursued in the *Methodus Studii Medici*, and in the *Bibliotheca Medicinæ*. This is in reality a very useful and entertaining part of his work, inasmuch as it forms almost a history of the progress of the science, from the time of Brunfelsius to his own.

He next delineates his own system of botany, according to which the plants are disposed. Throughout this great work, Haller is entirely

an original: not satisfying himself with giving the descriptions on former writers; he appears every where to have described the plant himself, and to have formed new genera, and commonly new specifical characters for the whole, accommodated to his own system. He informs us, that it was his custom to write down the natural characters of each plant on the day he found it.

In treating on each species, he has not only added a most copious number of synonymes, but, unsatisfied with Bauhin's Pinax, he appears to have consulted all the old authors, extricated, their synonymes, with uncommon diligence and singular discrimination, and arranged them, as much as possible, in chronological order; a method highly worthy of imitation, as it exhibits at one view, a brief history of the plant, by pointing out the first discoverer, and the regions of its growth. This, to the curious botanist, is a very meritorious part of Haller's labor. To each is subjoined a summary account, from the best writers, of the qualities and uses, both œconomical and medical. The work is embellished with plates of some rare species, remarkable for their exactness and delicacy.

Having, in 1741, obtained from the king of Great Britain the establishment of the physic garden at Gottingen, Haller published the following year a catalogue of its plants. This was but a small volume, but the list served to show the diligence with which he had fulfilled the intention of the royal founder. In 1753 he much enlarged it, and comprehended the plants spontaneously growing in the environs, especially

those of the Black Forest. He informs us, that this volume was the production of a three months vacation, and laments, that the importance of his other avocations prevented him from fulfilling his intention of describing the plants of Germany at large.

This little work is curious, since it exemplifies his system as extended to exotics, of which the new and rare kinds are herein described. But the small size of the volume precluded the introduction of the generical characters.

In 1745, he gratified the botanists by a new edition of the *Flora Jenensis* of Ruppius; and, that he might do justice to his author, he took a journey to Jena, where he gained access to the papers and *hortus siccus* of the author. He prefixed to this book anecdotes of this extraordinary man; and, by reforming the whole, and augmenting it with many plants, discovered by himself, he in some measure made it a *Flora Germanica*. These performances were by no means the termination of his botanical labors. On his return to Switzerland he continued his discoveries in this branch of natural history; he also sent, at his own expense, persons properly qualified into the less frequented parts of Switzerland.

The result appeared in a new edition of the *Enumeratio*, which however was so much improved and altered, that he considers it as a new work. It was published in three vol. fol. in 1768, under the title of *Historia Stirpium indigenarum Helvetiæ, inchoata*. The subject is arranged in his own method, with the alteration however, of inverting the order of the classes, beginning with the *Compositæ*, or the *Syngenesia* class of Linnaeus,

Linnæus, and ending with the *Cryptogamia*, which stood first in the *Enumeratio*; both of which are objectionable, as subjecting the student to the most difficult parts of the system at his entrance on the study. Several interesting particulars of the former publication are also omitted in these volumes, of which curious botanists will much regret the loss: for, though he has inserted with enlargement, the physical geography of Switzerland, with the account of those authors who had previously investigated the plants of the country, and has recited his own excursions for that purpose; yet he has not introduced the critical catalogue of the authors, satisfying himself with giving a bare list of all the botanical writings, from the time of Theophrastus to the year 1768. It is still more to be regretted, that Haller has suppressed, in this edition, a great number of synonymes under each plant; inserting only a few of those of later date. It may further be remarked, that although in all possible instances he has introduced the synonymes of Linnæus, yet he has, unfortunately for such as use the works of both, omitted the trivial names; a circumstance which renders his book much less useful to those who are conversant in the sexual system. Yet, if these are defects, they are doubtless more than compensated, by the innumerable improvements made in the descriptions, both of the genera and species, by the great addition to the number of plants, which are extended from 1840 to 2486, of which more than 800 are of the *Cryptogamia* class; Haller having, after Micheli, beyond any of his contemporaries, enlarged the order of Fungi, of which he tells us he had the

paintings of more than 400 species drawn under his own inspection. It is not, however, surprising, that Switzerland should produce a greater variety of vegetables than the middle parts of Europe; when we reflect that the alpine situations afford growth to the plants of the arctic regions, and the warm vallies of the same country, to many of those common to southern. The value of this edition is much enhanced by enlarging the observations on the uses of plants; and by referring to his authorities for what is not his own, with his accustomed accuracy. As an accession to this work, it may be added, that the author has, in the notes, under each genus, introduced the plants of Theophrastus and Dioscorides, in as many instances as they admit of being ascertained.

Few botanists have labored more than Haller; and yet his discoveries in botany occupied only a comparatively small portion of his time.

To such as feel not, in the fullest extent, that enthusiasm which the love of science creates, it may appear a paradox to assert, that the dissection of human bodies could be a pleasurable employment; yet Haller, in 1742, pronounced an elegant and spirited eulogium, in the university of Gottingen, to prove it; and his zeal in the pursuit of anatomical discoveries was attended with uncommon success. He seems early to have apprehended, that the knowledge of the distribution of the arterial system, had not kept pace with that of the bones, muscles, nerves, and viscera, which had been separately and ably treated by men of eminence. Haller, therefore, wished to illustrate more perfectly this part of the

human body; and he gave to the world a more complete system on the subject than had yet appeared. He published the first part of this great work in 1743, and the last in 1756. His tracts on other parts of anatomy, when collected in 1768, form three vols. in 4to. The curious reader may see an enumeration of his many discoveries in anatomy and physiology, at the head of the sixth volume of his Physiology: and although some of these discoveries may have been contested by his contemporaries, yet his unalienable right to most of them, and the light particularly which he threw upon incubation, ossification, irritability, and several other parts of the animal œconomy, will unquestionably secure to him a large and honorable share of fame with posterity.

Haller's emoluments augmented as his merits were displayed; and honors flowed upon him from all quarters. He was elected, in 1748, into the Royal Society of Stockholm, into that of London in 1749, and in 1754 chosen one of the eight foreign members in the Academy of Sciences at Paris. In 1739 he was appointed physician to George the Second, and king's counsellor in 1740. In 1749 the emperor Francis conferred on him letters of nobility at the request of George the Second; and about the same time the king, in a visit which he paid to the university, distinguished Haller with particular marks of approbation: an honor which the author gratefully acknowledges, in an English publication, entitled, "A short Narrative of the King's Journey to Gottingen," and in the dedication to George the Second, prefixed to his edition of Boerhaave's *Methodus Studii Medici*.

He declined, in 1745, an invitation to Oxford, which would probably have terminated in his nomination to the professorship of botany, vacant by the death of the celebrated Dillenius; a second from the university of Utrecht; and, in 1750, a third from the king of Prussia, with the offer of a very considerable pension.

But of all his promotions, none gave him more real satisfaction, than his election into the Great Council of Berne, as it ensured to him a retreat accompanied with dignity, and probably with emolument, in his native city, to which he looked forward with affection and attachment.

At length, in 1753, induced by the precarious state of his health, by the desire of removing from Gottingen, which he called the *grave* of his wives, and by his earnest anxiety to dedicate the remainder of his days to the service of his country, he took a journey to Berne, in order to procure an establishment, which, though not adequate to his present appointments, might place him in the bosom of his beloved Switzerland. Soon after his arrival, he fortunately obtained by lot the office of Amman: although this office was of small emolument, yet, as it might be considered a prelude to future appointments, and as it gave him an immediate opportunity of serving his children, he resigned his professorship at Gottingen, and settled at Berne. Such was the general joy of his countrymen on this event, that Morikof struck a medal to commemorate his return.

Having formed this resolution, he could not be shaken by the most splendid offers. He

declined, in 1755, the pressing invitation of Frederic the Second, to superintend the academies of Prussia, and to accept the chancellorship of the university of Hall, vacant by the death of Wolfe. In 1767, he rejected the offer of a very advantageous and honorable settlement at St. Peterburgh, made by Catharine the Second; and, in 1770, the still more dignified promotion to the chancellorship of the university of Gottingen, with a very considerable appointment; although George the Third wrote not only to Haller, but to the Senate of Berne, requesting their influence to persuade his acceptance of it.

His grateful country rewarded this disinterested attachment with the most liberal and unbounded confidence, and employed his talents in the public service.

In 1757, he was sent to reform the academy of Laufanne; and, in the following year, was deputed by the Senate to examine some curious remains of antiquity lately discovered at Culm. About the same time he was appointed director of the salt-works at Bex and Aigle, with an annual salary of L. 500. During the term of this appointment, which continued six years, he resided at La Roche.

In this retirement, he employed himself in superintending and improving the salt-works, of which he has given a short account; in making occasional excursions into the neighbouring country, which he has likewise described; but more particularly distinguished his retreat by preparing and publishing his great work on physiology.

Notwithstanding the amplitude and success of Haller's labors in the various branches of

medical knowledge, it was, however, principally on physiology, which seems to have been his peculiar delight, that he displayed the whole force of his genius, and that he founded his merit as an *inventor* in science.

His Outlines of Physiology, or *Primæ Lineæ Physiologicæ*, published at Gottingen in 1747, delineate the plan, and were the prelude to his immortal work, which he modestly styles *Elements* only, or *Elementa Physiologiæ corporis humani*, in eight volumes in quarto, which successively made their appearance from 1757 to 1766.

In conformity to Boerhaave's plan, this part of the science of physic is here emancipated from theoretical subtlety, from the shackles of metaphysical, mechanical, and chymical hypotheses, with which, for ages, it had been encumbered; and, for the first time, built on the true basis of anatomical knowledge.

It will be sufficient to observe, that the exquisite knowledge which he has displayed in relation to the structure of the human body, his indefatigable researches into the facts and opinions of all his predecessors, the judicious selection of them to establish his own, his skill in comparative anatomy, the extent of his own discoveries, and the application of the whole to illustrate the use of the parts in the human frame, afford such an instance of learning, industry, penetration, and genius, as will undoubtedly transmit the author's name to posterity among the greatest contributors to useful knowledge.

On his return to Berne he was elected member of the chamber of appeal for the German district, of the council of finances, of the committees for

matrimonial affairs, and for improving the small livings in the French district of the canton: he was also appointed perpetual assessor of the Council of Health, with an annual salary of about L. 100, as a token of his country's gratitude for having declined so many splendid offers from foreign courts, and for preferring his native place to the advancement of his fortune.

In these several offices he performed essential services to the state, by promoting the most useful institutions, proposing necessary alterations, and in framing new laws and ordinances. In his capacity of assessor to the Chamber of Health, he was particularly useful in forwarding the most important regulations; such as the prohibition of empirics, the recovery of drowned persons, and the means to prevent the spreading of the infectious distemper then prevalent among the cattle in various parts of Europe.

He also shewed himself a friend to humanity, by the zeal with which he assisted in obtaining from government a public establishment for orphans, by his activity in providing it with a fund, and by drawing up the plan. As a member of the Oeconomical Society, he labored much to improve the state of agriculture, and made many experiments conducive to that end. In the meetings of the Great Council he delivered, on important occasions, his opinion with a manly freedom and lively eloquence, the result of the soundest judgment and the most feeling heart.

In 1766, and the following years, this great man, who had hitherto enlightened science from his closet, displayed in the theatre of public life the more active and distinguished parts of a patriot

and politician. He re-established the harmony and settled the disputes between the Vallais and the canton of Berne by a successful negotiation in which he fixed the new boundaries of the two states; he was associated with the most enlightened characters of the republic in terminating the dissensions of Geneva; he drew up the principal despatches to the court of Versailles on the subject of the changes which had been projected at Versoi, on which occasion he held a personal conference with the French ambassador; and was employed to prepare the plan of a treaty, which the canton of Berne contracted with the Elector of Bavaria relating to the purchase of salt.

On the conclusion of these public employments, Haller, who had now attained the sixty-second year of his age, withdrew himself from the bustle of life, and lived in a more retired manner, fulfilling the duties of a father, a citizen, and a magistrate; and, although his health gradually declined, yet his activity still remained undiminished.

He resumed his literary labors, which had been necessarily interrupted amidst his other more important avocations. He published, in 1768, his history of Swiss plants, mentioned above; and, in 1771, the first part of his *Bibliotheca Medicinæ*, or his Medical Library.

No part of Haller's writings affords a more striking example of the value of early and persevering industry, than this publication. That habit which he had formed, so early as from the eighteenth year of his age, of noting his opinion of books and authors, necessarily accumulated a considerable mass of materials; and

thus enabled him afterwards to turn them to very useful purposes.

By these means the foundation of his *Medical Library* was laid, even before he gave the improved edition of Boerhaave's *Methodus Studii, Medici*, in 1751.

Boerhaave used to recommend to his students the books which they ought to consult on each subject: this catalogue was, in 1726, surreptitiously and inaccurately printed, and formed only a small volume in octavo; many necessary observations were forgotten, and various authors both modern and ancient were omitted. Haller undertook to remedy these deficiencies; and extended the publication to two volumes in quarto. In order to appretiate the merits of this compilation, it is necessary to observe, that various lexicons and catalogues of medical authors were extant; but the writers had merely given bare lists and titles, unaccompanied by that critical discrimination of the design, doctrine, and general merit of each author, which rendered these volumes so highly acceptable. In this manner Haller has given, under that classical method which Boerhaave had formed, his opinion of more than 4,000 volumes.

In the extension of this plan, as it appears in his own *Bibliotheca*, Haller begins, by tracing the history of each branch of medicine from its origin, through the preceding ages; and by connecting the history of each in the several periods, has, in some measure, made his publication a compendious history of physic.

Haller's extensive knowledge of ancient and modern languages, enabled him to comprehend a large field; and his indefatigable industry,

united to great penetration in investigating the doctrines of the ancients, equally exhibits his erudition and that sound judgment by which he has appretiated the merit of those sages of phyfic, in a manner highly interesting and instructive.

In his judgment of the moderns he is candid and impartial; his great knowledge of his subjects qualified him to distinguish all original doctrines, new facts, and observations, and to guard against such errors as might mislead young and incautious practitioners; who are but too apt to be influenced in their practice, by imbibed theories, and prejudice towards particular authors.

He has given additional value to his work, by annexing to the account of celebrated books, short biographical anecdotes of the author. He mentions all the different editions, that came to his knowledge, and particularly marks such as were in his own library. And it is a matter of astonishment, that in this manner he notices and reviews not fewer than 11,000 volumes. As the literary history of phyfic was among the favorite objects of Haller, this publication cannot but be highly acceptable to such as possess a congenial taste; while the general use and information they afford are sufficiently obvious.

Eight volumes of this work were published during the author's life-time, between the years 1771 and 1778. The anatomical, including the physiology, the botanicaal, and the chirurgicaal, were each comprised in two volumes, and bring down the respective subjects nearly to the present time. Two, on the practice of phyfic, were published by Haller himself, a third after his decease by Dr. Tribolet, and a fourth by Dr.

Brandis of Childensheim, from the manuscript of Haller, which the learned author has considerably augmented.

Haller also employed the latter period of his life in sending extracts from eminent publications for the *Bibliothèque Raisonnée*; furnished many of the articles for the supplement to the Paris Encyclopédie, for the quarto improved edition of the same work published at Yverdun, and for the dictionary of natural history printed at the same place. He meditated also a new edition of his great physiological work, of which he put forth the first volume in 1777, only a few months before his death.

His active imagination brooding on the civil and political affairs, in which he had been lately engaged, produced, between 1771 and 1774, his three political romances, *Ufong*, *Alfred*, and *Fabius and Cato*, which treat of the despotic, monarchical, and republican governments. In *Ufong* he sketches, with a masterly hand, the abuses of absolute authority and sets forth, in the character of the principal personage, the happy effects which may be derived from a virtuous and intelligent sovereign, even amidst the horrors of oriental despotism. In *Alfred* he displays the advantages of a limited monarchy, wherein the balance of power is wisely distributed; and which, while it avoids the extremes of either, enjoys the benefits of both. In *Fabius and Cato* he describes, with an animation and spirit worthy of ancient Rome, but with a partiality natural to a republican, the aristocratical government as most friendly to the display of patriotism, and most congenial to the exertions of genius. In these romances

he discovers sound principles of legislation, great political sagacity, a deep insight into human nature, and a most extensive acquaintance with history.

If we consider Haller as a man of piety and a Christian, we shall observe him tracing, from a comprehensive view of the creation in its grandest as well as in its minutest parts, the *necessary* existence of a Supreme Being, and the great principles of natural religion. We shall see him demonstrating the divine origin of Christianity from a profound study of the New Testament, from the excellence of its morality, its manifest influence over the happiness of mankind, and its tendency to meliorate our nature; and we shall find him proving himself, both in his life and writings, a zealous friend and able advocate of the revealed doctrines.

Haller, at a very early period of his life, undertook the defence of natural and revealed religion on all occasions. In 1732 he declared, in his preface to his poetry, that he was firmly convinced of their truth; in 1747, he rejected with horror the dedication which La Metrie offered to prefix to his work entitled "*L'Homme Machine*;" and he declared, in various literary journals, that he neither acknowledged as his friend, or his disciple, a man who entertained such impious notions. In a preface which he published in 1751, to Formey's abridgement of Crouzas's "*Examen du Pyrrhonisme*," he paints, in the strongest colors, the dreadful effects of infidelity both on society and individuals. He also put forth, in the German tongue, "Letters to his Daughter, on the Truth of the Christian Revelation;" he published

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an extract from Ditton's "Truth of the Resurrection of Jesus Christ," which he acknowledges to have first cleared any doubts he might entertain on that subject. He avows, at the same time, that he received infinite satisfaction from the study of the New Testament, because he was never more certain of holding converse with the Deity, than when he read his *will* in that divine book.

In 1775, he finally gave to the public, also in the German language, "Letters concerning several late Attempts of Freethinkers yet living against Revelation." In this work the author examines and refutes the objections to Christianity, advanced in so lively and dangerous a manner by Voltaire in his "*Questions sur l'Encyclopédie*. If this latter publication," adds Sennebier, "may be considered as an Index to the Doubts and Arguments against the Christian Religion, the work of Haller may be entitled an Index to the Answers in favor of the same Revelation, to be consulted by those who wish impartially to discuss both sides of this important question." When learning and philosophy, instead of being employed in supporting sceptical tenets by artful sophistry, thus lend their united assistance to the cause of religion, they then truly become an honor to the possessor, and a benefit to society.

Even this great and good man was not exempt from a too anxious sollicitude for his welfare in a future state. That depression of spirits, which ought justly to be considered as the effects of disease, and the warmth of his imagination conspiring perhaps with the narrow principles of Calvinism, in which he had been educated, led him to reflect rather on the *justice* than the *mercy* of

the Deity, and to bewilder himself in the endless mazes of predestination and grace. In one of his desponding fits, he compared himself, as uncertain of salvation, to a man placed on the edge of a precipice without any support, and expecting every instant to fall. At another moment, animated with a passion for science, he breaks out, in a letter to his friend Bonnet, into the following exclamation, expressive of his regret to quit a world which he had improved by his discoveries, and which he might still further illuminate by his zeal and application. "O my poor brain, which must return to dust; and all the knowledge and information which I have been collecting with such unwearied labor, will *fade away* like the dream of an infant."

These little weaknesses of a great mind overpowered by constitutional irritability, and struggling against early prejudices, are more interesting to the man who feels and respects the imperfections of human nature, even in its most exalted state, than the most pompous and exaggerated accounts of *unerring* wisdom, or *uniform* virtue which never existed. And it is a pleasing satisfaction to learn, that reason and religion rose superior to the gloomy despondency of sickness; and that Haller met death with the calmness of a philosopher, and the faith of a Christian. In the last letter which he wrote, a few days before his decease, he speaks indeed of the tremendous grandeur of eternity, but with hopes rather than with fears; and looks back upon his past life with satisfaction: amidst a few complaints uttered on his painful sufferings, he mentions his country with the most ardent affection, and

offers up his last prayers for its preservation and welfare.

He continued his literary labors, and preserved his senses and composure to the last moment; he beheld his end approaching without fear and regret; My friend," said he to the physician who attended him, "I die, my pulse is stopped," and then expired. He died on the 12th of December 1777, in the seventieth year of his age.— Thus lived, and thus died, the great Haller; a man to whom Michaelis, the eminent orientalist, justly applies an observation which had been made on the genius of Aristotle; "*Neque cælo, neque terrâ, neque mari quicquam relinquere voluit incognitum, indole præterea adeo mirabili, ut ad singula natum præcipue dicas*⁶."

In his person Haller was tall and majestic, of a serious and expressive countenance; he had at times an open smile, always a pleasing tone of voice, usually low, and seldom elevated, even when he was most agitated. He was fond of unbending himself in society, was on those occasions remarkably cheerful, polite, and attentive; he would converse with the ladies on fashions, modes of dress, and other trifles, with as much ease as if he had never secluded himself from the world.

Mr. Bonnet informed me, that Haller wrote with equal facility the German, French, and Latin tongues; that he was so well acquainted with all the European languages, except the

⁶ He left nothing unexplored, either in the heavens, on the earth, or in the sea, and was of such a wonderful capacity, that he seemed born for the immediate object of his pursuit.

Russian, Polish, and Hungarian, as to speak with the natives in their respective idioms. When he conversed on any science or subject of literature, his knowledge was so extensive, that he seemed to have made that his particular study. His profound erudition in every branch of science, is well known to all who are conversant with his works: but the variety of his information, and the versatility of his talents, are thus delineated by a person⁷ who was his particular friend. "He possessed a fundamental knowledge of natural history; was well read in history both ancient and modern, universal and particular; and uncommonly versed in the state of agriculture, manufactures, trade, population, literature, and languages of the respective nations of Europe: he had read with attention the most remarkable voyages and travels; and was particularly conversant in the late discoveries which tend to illustrate the geography of the globe. He had even perused many thousand novels and plays; and possessed such an astonishing memory, that he could detail their contents with the utmost precision.

As it was his custom to make extracts, and to give his opinion of every book which came into his hands, as well for his own private use, as for the *Gottingen Review*⁸, he read most new publications, and so eager was he usually in the perusal, that he laid them upon the table even

⁷ Tschärner, Lobrede, &c. p. 87.

⁸ Haller reviewed, as his department for that literary journal, all publications on history, medicine, anatomy, natural history, and several miscellaneous works, particularly those which appeared in Italy.

when

when he was at dinner, occasionally looking into them, and marking those parts with a pencil, which he afterwards extracted or commented upon. He was accustomed to make his remarks on small pieces of paper, of different sizes, which he placed in order, and fastened together; a method he learned from Leibnitz.

He derived from nature extreme sensibility, or rather irritability of temper, which is ever the child of genius. He spoke therefore from his own experience, when, in a letter to Voltaire, he thus expressed himself: — “ Providence holds with an equal hand the balance of human happiness. He has loaded you with riches, he has loaded you with glory; but misfortune was necessary, and he preserved the equilibrium by giving you sensibility. If my wishes could take effect, I would bestow upon you that *tranquillity* which flies at the approach of genius, which is inferior to genius in relation to society, but far superior in regard to ourselves: then the most celebrated man in Europe should be at the same time the most happy². ”

He was always impatient under sickness as well from his extreme susceptibility of pain, as because he was precluded in that situation from

² Il faut bien que la providence veuille tenir la balance égale pour tous les humains. Elle vous a comblé de biens, elle vous a comblé de gloire; mais il vous falloit du malheur, elle a trouvé l'équilibre en vous rendant sensible. — Si les souhaits avoient du pouvoir, j'ajouterois aux bienfaits du destin; je vous donnerois de la tranquillité, qui fuit devant le génie, qui ne le vaut pas par rapport à la société; mais qui vaut bien d'avantage par rapport à nous-même: des-lors l'homme le plus célèbre de l'Europe seroit aussi le plus heureux.

his literary occupations. He was fond, therefore, of taking violent remedies, more calculated to remove the immediate effects of pain, and to check his disorder, than to cure it radically. In his latter years he accustomed himself to opium¹, which, operating as a temporary palliative, only increased his natural impatience. This restlessness of temper, which occasionally disturbed his tranquillity even in his younger days, and in the full flow of his health and spirits, was considerably heightened by the advances of age, and the disorders which shattered his frame towards the close of his days.

His correspondence in every period of his life was extensive, punctual, and carried on in the English, French, German, Latin, and Italian languages.

Six volumes of Latin epistles, and three in the German tongue, addressed to him from men of learning in various parts of Europe, have been given to the public, but his own have never made their appearance. It is much to be lamented, that he seldom preserved any copies, being himself too much occupied for that purpose; and never sufficiently rich to maintain a secretary. His two principal correspondents, to whom he opened his heart, were Bonnet of Geneva, and John Gesner of Zurich: to the latter he wrote either in German or Latin, to Mr. Bonnet in the French tongue. This celebrated friend of Haller possesses seven manuscript volumes of his letters: it was an uninterrupted correspondence of twenty-three

¹ Zimmermann informs us, that he took daily so large a quantity as eight grains, *Ueber die Einsamkeit*, p. 216. ed. Leipf. 1784.

years ; begun in March 1754, and finishing only a few days before his death, in December 1777. This epistolary commerce comprehends a great variety of subjects, principally concerning physiology, natural history, the structure of the globe, politics, morality, and religion. Haller being accustomed to consult his friend on all occasions, to disclose his most secret thoughts, and to relate his diurnal occupations; these effusions of the moment discover the successive train of his studies, the progress of his discoveries, and his gradual advances in knowledge.

“These letters of my most respectable friend,” added Bonnet, “display his genius, his understanding, and the goodness of his heart, more fully than any of his publications. His style, concise, energetic yet picturesque, corresponds with the strength and originality of his ideas; and he speaks, with no less sublimity than conviction, of the great truths of natural and revealed religion. Though he treats the numerous advocates for infidelity, and particularly Voltaire, with sufficient severity; yet his heat is the ardor of conviction, and did not proceed from either pique or spirit of contradiction: he seemed as if he was personally interested in all questions on revelation, and pleaded its cause as if it had been his own. He is no less severe against those writers, who seem to exclude the intervention of a first intellectual cause in the creation and arrangement of the universe, and particularly censures the materialists, who endeavour to deduce mechanically the formation of organized bodies. In a word, his philosophy was entirely practical, because it was entirely Christian; and

nothing secured his approbation, but what tended to improve the understanding, or to amend the heart."

I am concerned to find, that the publication of this correspondence, between two such enlightened and virtuous philosophers as Haller and Bonnet, which in some works had been announced to the public, should, on account of private reasons, be relinquished. Religion, morality, philosophy, and learning, would be greatly benefited by this epistolary commerce.

Haller's library, consisting of about 4,000 volumes, was purchased for L. 2,000 by the emperor, for the public library of Milan, where I examined it in 1785. The collection is particularly rich in books of natural history, and is rendered invaluable from numerous annotations of Haller, written on the margins.

Haller was three times married, first to Marianne Wytsen, in 1731, who died in 1736. 2. To Elizabeth Buchers, in 1738, who died in childbed the same or the following year; both natives of Berne. 3. In 1739, to Amelia Frederica Teichmeyer, a German lady, who survived him. He has written and published the lives of his two first wives. He left eight children, four sons and four daughters, all of whom he lived to see established. His eldest son, Gotlieb Emanuel, who was born in 1735, followed his father's example in dedicating himself to the service of his country, and to the pursuits of literature. He was elected member of the Great Council, and obtained various employments under government, particularly the bailliage of Nyon, in which situation he died in 1786. He distinguished

himself as an author by various publications tending to illustrate the history and literature of Switzerland, and particularly by his *Schweitzerbibliothek*, or Swiss Library, in 6 volumes 8vo. of which he lived to publish only the first. In this work, deservedly esteemed for its method and accuracy, the indefatigable author enumerates all the books which treat of Switzerland, in all languages, and all the works published by the Swiss on all subjects. He even descends to the minutest articles which have appeared in reviews and journals; and in most instances, where the publication deserves detail, analyzes the contents, corrects the errors, and gives his opinion on the merits of the performance.

I was personally acquainted with the learned author, and am indebted to him for some curious information on Switzerland, and for several anecdotes relative to his illustrious father, which I have introduced into these biographical memoirs.

LETTER 58.

Mr. Sprungli's Collection of Swiss Birds—Of the Bearded Vulture.

MR. Sprungli's cabinet of natural history is remarkable for the collection of stuffed birds, both local and migratory, that are found in Switzerland.

In 1776 this collection consisted of two hundred specimens; and when I last visited Berne, in 1786, it had received an addition of fifty species.

One of the most remarkable birds in Mr. Sprungli's collection, is the *vultur barbatus* of Linnæus, the *vultur aureus* of Gefner, or bearded vulture of the English ornithologists. As many fabulous tales have been related concerning its uncommon strength and rapaciousness; as great confusion has arisen from the variety of names applied by different naturalists to the same bird; and as some travellers have doubted whether this specimen is the large vulture of the Alps, or the golden vulture of Conrad Gefner; I shall here subjoin a description from particulars principally communicated to me by Mr. Sprungli himself.

This specimen was a female bird, caught in the canton of Glaris; it measured from the tip of the beak to the extremity of the tail, six feet six inches French ¹ measure; and eight feet from the tip of one wing to that of the other expanded. It weighed, when first taken, eleven pounds. This bird, though always called a vulture, yet differs from that genus, and is referable to the eagle, in having the head and neck covered with feathers; whereas one of the distinctions of the vulture, according to Linnæus, is that the head is destitute of feathers.

Notwithstanding this distinguishing mark, by which it is referable to the eagle or *falco* genus; yet Linnæus was probably induced to class it with the vultures, from the general form of the body, and shape of the beak, which is the *first essential* characteristic in the genera of birds.

¹ Six feet eleven inches $\frac{1}{5}$ English, and eight feet six inches $\frac{6}{15}$.

Mr. Sprungli, however, is of opinion, that it might be classed between the vulture and the eagle; and Stor² proposes to form a new genus of it, under the name of GYPAETUS, by the following characters:

Rostrum rectum, basi cera instructum setis porrectis confertissimis barbatum; apice auctum unco sulcato.

Caput pennis tectum.

The specific character he would define thus:

Gypaetus (grandis) albido-rutilus dorso fuscus, tænia nigra supra et infra oculos.

It inhabits the highest parts of the great chain of the Alps which separates Switzerland from Italy, makes its nest in clefts of rocks inaccessible to man, and usually produces three young ones at a time, sometimes four, if we may judge from that number accompanying the old birds, when they descend into the lower regions for prey. They live on animals which inhabit the Alps, such as the chamois, white hares, marmots, snow hens, kids, and particularly lambs, from which circumstance it is called *læmmer-geyer*, or *lamb vulture*.

If common report may be credited, this rapacious creature sometimes attacks even man, and carries off children. Mr. Sprungli, without absolutely denying the possibility of this account, has, notwithstanding all his researches, never been able to ascertain a well-authenticated instance; and thence rather concludes it to be a fable invented by the peasants to frighten their

² See Stor's *Alpen Reisen*, vol. i.

children. This species does not appear but in small companies, usually consisting of the two old birds and their young.

Conrad Gesner has given a short but accurate description of this bird under the name of *vultur aureus*, or gold-geyer³; and an engraving from a skin sent to him from the Grisons. This figure, although rudely executed, yet exhibits with sufficient accuracy the distinguishing characters of the species and genus, such as the configuration of the beak, the legs feathered down to the claws, and particularly the beard. In fine a comparison with the specimen in Mr. Sprungli's collection evidently proves that it is the same bird.

Since this great naturalist, no other person seems to have described it from nature, except Edwards, under the denomination of the bearded vulture. The description of that bird, and the engraving given by Edwards⁴ from a specimen sent from Santa Cruz in Barbary, correspond exactly with the *vultur barbatus* of Sprungli.

Mr. Sprungli also favored me with the following remarks, in answer to those travellers who assert, that his specimen is not the large vulture of the Alps, sometimes called, from its *yellowish* plumage, the *vautour jaune*, but a small species; because the larger sort measures sometimes fourteen feet, or more, from the tip of one wing to that of the other. He possesses two specimens

³ See *Hist. Avium*, edit. Frank. p. 710.

⁴ See tab. 106, of his *History*.

of this bird; the one a full grown female, from which my description is taken, measuring eight French feet: the other is a male, but young, and is somewhat less. He has also examined four specimens, none of which measured more than nine feet; but as these several specimens were not full grown males, he is ready to allow, that an instance or two may possibly have occurred, in which this bird may have measured near twelve feet from tip to tip of the wing. Those who give it a greater expansion, have derived their information either from persons who were not naturalists, or from uncertain and exaggerated reports. The same remark may also be applied to the fabulous stories recorded by the peasants, concerning its wonderful strength as well as size. It is likewise to be observed, that the peasants do not confine the name, of *lämmer-geyer* to this species; but extend it indiscriminately to several large birds of prey, from whence has arisen great confusion of names, and much uncertainty in the accounts of this bird.

Some ornithologists seem to have formed of it several species, which on comparison will appear to be the same, or only varieties of the same species. Thus the bearded vulture, the cinereous vulture, and the fulvous vulture, which Mr. Latham has described as three different species, are probably the same bird as that in Mr. Sprungli's collection. Of the first there can be no doubt, since Mr. Latham refers to the bearded vulture of Edwards, which I have shown to be that of Mr. Sprungli. The cinereous vulture is described by Latham after Brisson: "Beneath the throat hangs a kind of beard, composed of very narrow

feathers like hairs; legs covered with feathers quite to the toes, which are yellow; claws black⁵. This description accords with the bird in question, and particularly in the beard, which is the distinguishing characteristic.

The fulvous vulture of Latham is the griffin of Buffon: and the French naturalist doubts whether it is not a variety of Gefner's golden vulture, which is proved to be the same as Mr. Sprungli's specimen.

While the most celebrated ornithologists have thus given to the bird different names, they have also in other instances confounded it with other birds, to which it has no other resemblance than that of size, strength, and voracity.

Thus Buffon erroneously conjectures the *vultur gryphus* of Linnæus, or the *condor*⁶ of America, to be the same as the *læmmer-geyer*, or vulture of the alps; whereas the description of the condor given by Linnæus, as well as by those who had seen it, differs entirely from that of the bearded vulture. The condor is described by the Swede as having "the head destitute of

⁵ *Syn.* vol. i. p. 14.

⁶ Mr. Latham, in his Supplement to the General Synopsis of Birds, p. 1. seems also to adopt the conjecture of Buffon, in classing the *Læmmer-geyer* and *Condor* under the same species; though he confesses, "that it still remains dubious, whether the *Læmmer-geyer* be the same with the *Condor*, or a mere variety of the *Bearded Vulture*." He adds also, with a candor which does him honor, "It is much to be feared, that other authors, as well as myself, have greatly confounded the species of *Vultures*; for being, like the *Falcon* tribe, long lived, their plumage puts on a great variety of drefs, sufficient to deceive those who have hitherto attempted to discriminate them."

feathers, but covered with a flight brown colored down, with a comb reaching along the top of the head, and having the throat naked and of a reddish color." Frezier, in his Voyage to the South Seas, also thus describes the condor: — "We one day killed a bird of prey called a condor, which was nine feet from the end of one wing to the end of the other, and had a brown comb or crest, but not jagged like a cock's: the fore part of its throat is red without feathers, like a turkey; and they are generally large and strong enough to take up a lamb. In order to get them from the flock, they draw themselves into a circle, and advance towards them with their wings extended, that being drove together, and too close, they may not be able to defend themselves; then they pick them out and carry them off. Garcilasso says, there are some in Peru sixteen feet from the point of one wing to the other, and that a certain nation of Indians adored them."

Mr. Latham seems also to be no less mistaken, when, on the authority of the translator of the Abbé Fortis's Travels into Dalmatia, he conceives the *vultur percnopterus* of Linnæus to be the *vautour des Alpes* described by Conrad Gesner, and the same as Mr. Sprungli's specimen; whereas, on the authority of Hasselquist, who saw great numbers of the *percnopteri* in Egypt, the head of that bird is "naked and wrinkled;" and Ray says, the feet are naked; two characters that essentially distinguish it from the bearded vulture, in which the head is wholly covered with feathers, and also the feet down to the ends of the claws.

The bearded vulture, besides inhabiting those Alps which separate Italy from Switzerland, is found in Corsica and Sardinia. M. de Hahn informed Mr. Sprungli, that he saw a bird in Corsica which was wounded in the wing, and showed as a sight, that was unquestionably the same as Mr. Sprungli's stuffed specimen: and Mr. Lettel, in his Natural History of Sardinia, gives a figure and description of the same bird, under the name of *bartgeyer*, or bearded vulture. It has also been found in the mountains of Africa, since Mr. Edwards received his specimen from Santa Cruz in Barbary. It is also frequent on Caucasus and the mountains of Dauria, or the south-eastern part of Siberia, as we learn from the travels of both Pallas and Gmelin.

On the crows it is worthy of observation, that the *corvus graculus* of Linnæus, or *coracias* of Brisson, is faithfully represented by Mr. Pennant, in his British Zoology, under the denomination of the red-legged crow. It is the same bird of which Conrad Gesner⁷ has given a figure, and to which he applies the German appellations, *tahe*, *steintahe*, *steinkræe*, and which he justly suspects to be the *cornix cornubiæ*, or the red-legged crow. The *pyrrhocorax* of Gesner, which some ornithologists seem to have confounded with the *corvus graculus*, is however very different, and is called by Linnæus *corvus pyrrhocorax*. Both these species inhabit the Alps, but the *pyrrhocorax* is the most common; and these appear, according to Mr. Sprungli's observations, to be the only species of the crow genus that prefer to all others alpine situations. As to the

⁷ Hist. Av. ed. Frank. p. 468.

corvus eremita of Linnæus, Mr. Sprungli acknowledges it is totally unknown to him. All the ornithologists indeed mention this bird as an inhabitant of the Alps, on the authority of Conrad Gesner, who describes it under the name of *corvus sylvaticus*, accompanied with a figure, which has not the least resemblance to a crow, but rather to a curlew; yet Gesner's description of it is much too imperfect to assist us in ascertaining the bird of which he treats.

L E T T E R 59.

Mr. Wyttenbach's Collection — Account of the Chain of Hills and Alps seen from the environs of Berne.

THE Reverend Mr. Wyttenbach of Berne possesses a very curious cabinet, principally relating to the natural history of Switzerland, and to the canton of Berne in particular. It contains specimens of several thousand plants, among which is a large number of the alpine plants of Switzerland; and he has already begun to arrange separately the capsules, seeds, and fruits.

It is still more interesting for the great variety of fossils, stones, and petrifications collected by himself in the neighbourhood of Berne, and from the upper and lower Alps.

Mr. Wyttenbach also possesses various shells, insects, and numerous drawings of the glaciers and upper Alps, which cannot fail of being highly pleasing to the curious traveller.

But I was most struck with that part of his cabinet, comprehending those objects of natural history, which in any degree influence agriculture, physic, arts, and trades; and which sufficiently prove the utility of that science in the progress and improvement of human comfort and knowledge. On this subject he has already published a dissertation in the Acts of the Oeconomical Society at Berne.

He has not formed this ample collection from mere motives of curiosity, or from desultory views, but with a settled intention to illustrate the natural history of Switzerland in general; to form a topographical and mineralogical description of the canton of Berne in particular; and to elucidate the original formation of mountains, which is the favorite object of his researches, and which his frequent visits to the Alps will assist him in executing with fidelity and accuracy.

At my request, this indefatigable observer favored me with a description of that range of Alps which is seen from Berne, and of the intervening district; an extract from which I now submit to your perusal.

That part of the chain of Alps seen from Berne, distinguished by the different names of Wetterhorn, Schreckhorn, Eger, Jungfrau, Lauter-Aar-Horn, Blumli Alp, &c. forms an immense amphitheatre, gradually rising from the environs of Berne, to those elevated peaks, covered with eternal snow, and hitherto inaccessible.

The plains and hills between Berne and Thun are composed of rounded stones and argillaceous stones called *molasses*, frequently ranged in alternate strata.

The *molaſſe* at Gurten, about two miles from Berne, contains, though rarely, *gloffopetræ*; and the ſtrata of Belpberg, about ſeven or eight miles from the capital, are full of different ſpecies of *chamites*, *oſtracites*, *globosites*, *felenites*, *ſtrom-bites*, and other ſimilar petrifications.

The ridge of hills which border the high road between Berne and Thun contains, in ſeveral places, and particularly above Muſingen, an extenſive ſtratum of *oſtracites*, ſome pieces of which weigh more than fifteen pounds each. The ſituation of the ſtrata in theſe different hills, their direction, their nature, and the bodies which they encloſe, ſeem to prove, that theſe hills formed anciently one great plain, which has been ſince hollowed and divided by the waters, particularly by thoſe of the Aar.

On the ſlopes and ſummits of theſe hills, which in ſome places are of conſiderable elevation, are frequently found thoſe large maſſes of granite, which furniſh materials for the public works and buildings of Berne. Theſe maſſes ſo nearly reſemble the granite of the Grimſel, and of the mountains which compoſe the great central chain of the Alps, as to render it probable, that in the ancient revolutions of this globe, they have been brought by the waters to the places where they are at preſent found, before the deep vallies, which now ſeparate them from their original mountains, exiſted. The ſame remark may be as juſtly applied to the blocks of marble and other calcareous ſtones, which, though now removed to a conſiderable diſtance from their native ſituation, are alſo diſcovered in large quantities

upon the hills adjacent to Berne, and which likewise serve for the buildings of that capital.

As we approach the town and lake of Thun, the view opens and discovers, towards the south-east, that high calcareous chain, of which the Stockhorn, the Neueren, and the Ganterish have been illustrated by the botanical labors of the celebrated Haller. This chain, which joins that of Schwartzenburgh towards the canton of Friburgh, is chiefly calcareous, and contains fewer petrifications than the above-mentioned hills: it is not of sufficient elevation to be covered with snow in summer.

The Niefs, which is the last mountain in this calcareous chain, stands on the borders of the lake; and separates the valley of Frutigen from that of Simme. It is peculiarly interesting to travellers, on account of the fine view from its summit; and to naturalists, because it joins to the Alps. Towards its foot beds of slate have been discovered; higher up it is of calcareous stone; and near its top is found a species of pudding-stone, filled with small fragments of broken petrifications.

In traversing the lake of Thun, its borders, which are planted with vines, are composed of rounded stones, united by a calcareous cement, as far as the mountains of St. Beat. There, near Rallingen, the rocks are calcareous and rugged, containing, in a few places, broken petrifications, of which it is often difficult to ascertain the species. On continuing my route at the foot of the St. Beat, I observed the first rocks, that are absolutely perpendicular, and even impending, and which

which are marked at different elevations with furrows, occasioned by the waters of the lake, that, in former periods, was probably several hundred feet above its present level. I remarked the same furrows nearly at the same elevations, in the vallies of Lauterbrunnen and Hasli, which coincidence seems to prove, that the lake of Thun once extended over all these parts, covered the whole plain of Berne, and reached as high as the Lengenbergl, where Gruner discovered those petrifications called Pholades.

Having traversed the lake of Thun, I entered the narrow but agreeable valley of Unterseen and Interlachen, on each side of which the mountains approach each other, and form, if I may so express myself, the *vestibule* of the alps. This valley, separating the lakes of Thun and Brienz, which appear to have been once united, is entirely formed by the stones which torrents have brought from the alps.

On the right is the Abendberg covered with trees and herbage, and stretching towards a group of mountains of considerable extent; yet little known, though their tops may be seen at Berne.

The Ballenhoechst, Sulek, Schnabelhorn, Schwartzberg, Schwalmern, Schilthorn, Kirchfluh, Latreyenfirst, and Dreyfspitz, are the most remarkable mountains in this group, which on one side borders the valley of Lauterbrunnen, and on the other towers opposite to the Niefs, at the commencement of the valley of Frutigen. It is united by means of the Sefinen alps with the Dents Rouges, and the great central chain of granitical mountains. The mountains of this group stand on a base of argillaceous schistus,

containing a few petrifications, which is rarely visible but at certain elevations. Towards Lauterbrunnen, particularly, a fine-grained calcareous stone abounds.

To return to the valley of Unterseen. On the left is another group of calcareous mountains, which extend along the lake of Brienz towards Hasli, and stand also on an argillaceous schistus, which is but rarely visible. And though the granitical chain is at a very small distance, it is, however, so entirely concealed by these secondary mountains, as to be no where discovered, except between Unterseen and Interlachen, where the Jungfrau presents herself in all her majesty.

From these delightful plains I attempted to penetrate towards the granitical chain of alps, through narrow vallies enclosed between perpendicular rocks of an enormous height; but every where I met with secondary mountains, which, to a considerable height, conceal the primitive bed of granite, and render the approach to it extremely dangerous, if not impracticable. Thus the valley of Lauterbrunnen is bordered by calcareous rocks even to its farther extremity. At Sichelauinen the first masses of granite appear, forming the base of the calcareous rocks, which are of a very great height. As I continued my route towards the chain, which stretches from the Jungfrau to the Grofshorn and Breithorn, I observed a rock of steatite, in which some veins of lead have been discovered and worked at Hohalp. Higher up is the true granitical chain, which, however, even there is frequently covered with calcareous peaks.

I found the approach to this chain less difficult at Wengenalp, the last of a group of calcareous and schistous mountains between Lauterbrunnen and Grindelwald, which there joins the Jungfrau, the summits whereof appear to be of granite. In the valley of Grindelwald I observed only the argillaceous schistus and calcareous stone: the external parts of the Eger, of the Mettenberg, and of the Wetterhorn, are chiefly calcareous, and cover the granite of the central chain; and the only pieces of granite are the fragments, which are brought into the valley by the two glaciers. That chain, which is opposite to these glaciers, and borders the northern side of the valley of Grindelwald, has an argillaceous base, which, in several places, particularly towards Hasli, contains *cornua ammonis*: this base is also covered with calcareous rocks, through which it often penetrates at different heights.

I will now take a nearer view of the primitive chain, in order to trace the alps. I shall consider the Jungfrau as the centre, from which I will take my departure on one side towards the Gemmi, and on the other towards the Schreckhorn, Wetterhorn, and Grimfel.

The Jungfrau, or Virgin, is one of the highest and most beautiful mountains in the canton of Berne. The granite does not appear till a very considerable elevation; its foot being in most parts covered by rocks, which are of calcareous stone, called by the natives *Staldenfluh*, of which an elevated peak is denominated the Monk. On following these rocks to Sichelauinen, about two

leagues from Lauterbrunnen, I observed a red stratum, that seems to form the separation between the granite and the calcareous substance: it is composed of an argillaceous slate of red color, spotted with brown and green, and of a fine-grained iron ore (as I was surprised to find) containing anomites. I observed the same stratum at the bottom of the Eger and Wetterhorn, and of several mountains towards Hasli: I remarked it at different heights; but as all access to them has been hitherto found impracticable, I cannot attempt to explain a phenomenon, which merits a nearer investigation.

The chain of the Jungfrau stretches to the right by those inaccessible peaks called the Gletscherhorn, Ebenfluh, Mittaghorn, Grofshorn, Breithorn. I am entirely unacquainted with their structure, except from the fragments, which I have observed at their feet, or on the masses of ice descending from their tops. Limestone occurs at very considerable heights; particularly white marble, and a fine grey marble, which is the matrix of a red hematite filled with innumerable small crystals of iron of an octagon figure, and attractable by the magnet.

Besides these stones, I noticed on the glaciers of Breitlauinen and Breithorn, various species of granite, both foliated and in blocks, of ironstone, of *saxum fornacum*, or *stellstein*, and of argillaceous and micaceous schistus. All these fragments sufficiently prove, that granite prevails in the higher parts, although it is frequently covered with secondary mountains.

To the right is the majestic Blumlis alp, which is a fine object from the plains: a large glacier,

mentioned by no author, stretches at its feet. I first noticed it from the opposite heights of Oeschengrat, and at the same time observed, that the feet of the Alpschelenhorn and Blumlis alp are covered with black schistus, and that the granite is not apparent, but at a great height.

A few days after this expedition, I mounted to the summit of the glacier, called by the peasants Gamchigletscher, where it forms a very steep ridge towards the valley of Lauterbrunnen. From thence I beheld the vast amphitheatre of the Lauterbrunnen glaciers: I remarked also, that the valley of Lauterbrunnen ends at this place; that it has only one issue behind Blumlis alp, where a large glacier, with a plain and unbroken surface, stretches towards the valley of Gaster. Here then is the extremity of the valley of Lauterbrunnen, which expands at the feet of the Eger and the Jungfrau, continues almost in a straight line as far as Sichelauinen to the foot of the Gletscher-horn and of the glacier of Staufstein, where it forms an angle, and bends towards Blumlis alp.

The ridge of the glacier of Gamchi is of a black calcareous stone, which, in many places, is of a fine texture, and splits into lamina of a rhomboidal form; in other parts it is coarsely granulated, containing white and black spar.

The sides of the Blumlis alp, that border the glacier, are black slate, in which I found several belemnites, and a fragment of a cornu ammonis a foot in diameter. The pieces of granite which are discovered upon the glacier, and which most probably fell from the summits of the Blumlis alp and of the Dents Rouges, is very similar to

that granite, in which the veins of lead are traced near Sichellauinen in the valley of Lauterbrunnen.

The granitical chain, which extends on the right by the Alpfchelenhorn and the Altits, is entirely concealed and lost in Mount Gemmi, where only calcareous stone and slate are discovered. As I have not yet had any opportunity to examine the mountains of Simmenthal and of Gessenay, I cannot inform you, if the granite appears through their calcareous covering.

But let us return to the Jungfrau, and trace the mountains towards Grindelwald and the Grimsel. The two high pyramids which tower near the Jungfrau are the two Egers, called from their position Exterior and Interior. Calcareous stone is visible to a great height. Many persons indeed pretend, that the whole side of the Exterior Eger towards Grindelwald is entirely calcareous; but I am convinced, from repeated observations, that the substance of these mountains is granite, though it is covered with calcareous stone lying on reddish slate, which in many places forms a species of breccia, composed of an argillaceous base, covered with calcareous fragments. You observe behind the Exterior Eger two small peaks, which seem united by a ridge: these are the Viescherhorn and the Zesenberg, which overlook the inferior glacier of Grindelwald. The stones that have fallen on the glacier show, that their summits, as well as that of the Schreckhorn, are of granite in blocks, veined granite, and other lamellated rocks, which frequently contain green steatites, amianthus, and crystals of quartz.

The high peak, which appears to stand near the Zesenberg, is at a very considerable distance, and probably separated from it by large vallies of ice. This peak, that has hitherto escaped the mention of travellers, seems to be the Finster-Aar-horn, which can only be approached from the Grimsel; and by traversing the glacier of the Aar. I have seen it from the summits of the St. Gothard, from one of the heights which separate the valley of Grindelwald from the lake of Brienz; I have been at its foot upon the glacier of the Finster-aar; and on all sides, and in all places, its elevation is stupendous, and appears to me to exceed even that of the Schreckhorn, which has been hitherto considered as the highest.

The Schreckhorn, or peak of terror, rises between the two glaciers of Grindelwald. Concealed by its base, the Mettenberg, it is not seen from the valley of Grindelwald; and the rugged paths which lead across the superior glacier to its foot, are extremely difficult and dangerous. Part of it is observed from that glacier. The tops of the Mettenberg are of granite, and its lower parts of lamellated rock, blended with mica and quartz. The piked summits of the Schreckhorn, which rise to an enormous height, appear to be of pure granite and other primitive stones.

The next in this chain, is the Wetterhorn, or Stormy Peak, whose perpendicular sides border the superior glacier. The exterior part of this mountain is of calcareous stone to a very considerable elevation, but its summits are undoubtedly of primitive rock. I noticed along its sides

the same red stratum, which makes its appearance on the Eger and at the foot of the Jungfrau.

Behind the Wetterhorn is seen an elevated rock, which is said by the inhabitants of Grindelwald to border the glacier of the Lauter-aar, and which from thence has been ascended by several *chasseurs*.

On examining the stones which have been brought down by the superior glacier, I did not discover much granite in mass, but often veined granite, and lamellated rock, which frequently enclose pieces of the corneus spathosus mixed with steatites, pyrites, and quartz.

The foot of the Wetterhorn and that of the Mettenberg contain, in several places, a fine species of white marble, with red, green, and yellow veins: a quarry of which, now covered by the inferior glacier, was formerly worked.

In passing from Grindelwald to Meyringen, I traversed the Scheidek, which entirely consists of black slate, that stands on the foot of the Wetterhorn. This slate continues to compose the chain that divides Grindelwald from the plains of Hasli and the lake of Brienz.

As I descended the Scheidek, I observed, on my right hand, the chain that joins the Wetterhorn and runs towards the Grimsel. As I have not particularly examined this chain, I shall only remark in general, that from an investigation of the stones and fragments which strew the vallies and sides of the hills, it appears to contain the same species of marble which I found on the superior glacier of Grindelwald, also red slate, argillaceous breccia, and various granites. But this much is certain, that the front of these

mountains is entirely concealed by secondary substances; and that the true region of granite was not apparent, until I had passed Meyringen and ascended the Grimsel, during the greatest part of which ascent I only noticed lamellated rocks and granite. All the mountains which form the Grimsel and the neighbouring chain, are concealed by the Wetterhorn; they extend behind the Schreckhorn as far as the Finsteraar-horn. This is the true region of granite and other primitive rocks, the heart of the central chain, and the great observatory of the naturalist.

L E T T E R 60.

*Excursion to Thun, Worbe, and Hindelbank —
Tomb of Madame Langhans.*

THE environs of Berne are in general extremely delightful, and no road exhibits a more pleasing variety of hill and dale than that which leads to Thun. It runs through an agreeable country; winds through fertile meadows, enriched with dark forests of pine and fir, and occasional groves of beech and oak. The cattle, lately descended from the Alps, were browsing on the pastures, and added to the animation of the scenery. The well-being of the inhabitants is visible from the cultivation of the grounds, and the number and neatness of the cottages and farm-houses which are scattered about the

fields, skirted by trees, or half concealed amid tufts of wood.

Thun is distant about twelve miles from Berne: it occupies the bottom and the brow of a hill, and stands on both sides of the Aar. It contains twelve hundred souls, enjoys considerable immunities, has its own magistrates and courts of justice, in which the bailif from Berne always presides, and from whose decision an appeal lies to the capital. The inhabitants employ themselves in carding and spinning silk for the manufactures of Balle. Some of the burghers possess large herds of cattle.

To the north-east stands, on an eminence, the church and the castle, which is the residence of the bailif, and occupies the highest point. From its windows I enjoyed a most pleasing and extensive view, not inferior in its kind to any prospect in Switzerland. Underneath is the town, occupying both sides of the Aar, standing in a rich plain of pasture, and bounded by a chain of hills, black with forests of fir, which extend from Berne and join the Niefs, a brown and rugged mountain, that rises rapidly from the edge of the lake. To the east, a small ridge covered with vines and trees; and to the south-east, part of the lake of Thun, bounded by hills rising to the mountains and alps of Lauterbrunnen and Grindelwald, "*piled up to the clouds.*"

The Aar flows from the lake between two level promontories, prettily sprinkled with trees, on one of which stands the castle of Schadan. The lower parts of this view, contrasted with the rugged rocks and mountains, resemble a painting of Claude by the side of a Salvator Rosa.

From Thun I returned about six miles to the village of Maffic, where I quitted the high road and passed through pleasant thickets of beech and oaks, over fields and enclosures; the cottages and hamlets agreeably situated in lawns, and amid clumps of trees.

In about an hour and a half I entered the road which leads from Berne to Langnau, and ascended to the upper part of the village of Worbe, where I passed a most agreeable day with an amiable family, who favored me with a most cordial and polite reception. The view from their house, which stands in the midst of a field, is not inferior to that from the castle of Thun: it commands a rich enclosed and well-wooded country, gently broken into hill and dale, and watered by many lively streams; the huge white peaks of the Jungfrauhorn, Schreckhorn, and Wetterhorn, overtopping a hill embrowned with firs.

I made also an excursion to Hindelbank, a village about four miles from Berne, in order to examine the tomb of Madame Langhans, a most celebrated work of Nahl, a Saxon sculptor. Being employed in constructing a sepulchre for Count d'Erlach, he was lodged in the house of the clergyman, his particular friend, whose wife, a woman of uncommon beauty, expired in child-bed on Easter-eve. Struck with the time of her death, animated by the recollection of her beauty, sympathizing with the affliction of her husband, he conceived and finished this affecting monument. It is placed in the body of the church, sunk into the pavement like a grave, and covered with two folding-doors. When these are opened,

a grave-stone appears as if just rent into three fractures, through which is half discovered the figure of a woman slightly veiled with a shroud. She is represented at the moment of the resurrection, when "*the graves are commanded to yield up their dead.*" With her right hand she is gently raising that portion of the broken grave-stone which lies over her head; and in the other holds a naked infant struggling with its little hands to release itself from the tomb. "*Here am I, Lord, and the child whom thou gavest me,*"⁹ are the sublime words which form the inscription. Below is the name of the deceased, "Anna Magdalena Langhans, wife of the clergyman. Born 1723; died 1751." The workmanship is by no means inferior to the original design. The artist has formed the whole sepulchre out of one block, and so naturally expressed the swelling of the stone, that the fragments seem as if they had just burst, and were in the act of opening. The only circumstance to be regretted is, that the materials are not so durable as such a monument deserves; being of sand-stone, they are too soft to resist the effect of time, and even now exhibit some symptoms of decay.

Nothing perhaps can more strongly display the superior effect of simplicity over magnificence, than the comparison of this tomb with the mausoleum of count d'Erlach in the same church. The latter consisting of several marble figures, executed in a masterly style, and loaded with all the

⁹ Hier Herr bin ich; und das kind, so du mir gegeben hast. — An engraving of this monument is published by Mr. de Mechel of Basse.

emblems of rank and opulence, scarcely attracts a momentary attention; while this simple gravestone "*speaks home*" to the heart of every person of taste and feeling.

L E T T E R 61.

*Visit to Michael Schuppach, The Physician
of Langnau.*

Langnau, Sept. 18,

Y O U have heard, perhaps, of Michael Schuppach, the famous Swiss doctor; of whose sagacity in discovering the seat of disorders, and applying suitable remedies to them, many wonderful stories are recounted by travellers; and which, like Virgil's Progress of Fame, have increased in the marvellous in proportion as they receded from the scene of action. I am now lodged in the house of this celebrated Æsculapius: it is situated above the village of Langnau, on the side of a steep acclivity; from which circumstance he is generally styled *the physician of the mountain*.

Upon our arrival we found the doctor in his apartment, surrounded by several peasants, who were consulting him upon their respective complaints; each having brought with him a small bottle, containing some of his water: for, by inspecting the urine, this medical sage pretends to judge of the state of the patient. His figure

is extremely corpulent; he has a penetrating eye; and a good-humored countenance. He is seated opposite to the person who consults him, one moment looks at the water, the next at the patient; and continues examining alternately the one and the other for some time, occasionally whistling during the intervals. He then opens the state of the case, acquaints the consultant with the nature of his complaints, and has sometimes the good fortune to hit upon the true cause. In a word, his knack of discovering disorders by urine, has gained such implicit faith in his skill, that we might as well question the Pope's infallibility before a zealous catholic, as the doctor's in the presence of his patients. He has certainly performed several great cures; and the rumor of them hath brought persons from all quarters of Europe, who are come hither for his advice.

The doctor was formerly a village surgeon, has a slight knowledge of anatomy, and is tolerably versed in botany and chemistry. His acquaintance with the theory of physic is said to be inconsiderable: the greatest part of his knowledge being derived from his extensive practice, notwithstanding he never stirs a quarter of a mile from his own house; for he would not take the trouble of going to Berne, even to attend the king of France.

It is more than probable, that much of this extraordinary man's success, is owing to the great faith of his patients; to the benefit they receive from change of climate; to the salubrious air of this place; and to the amusement arising from the constant succession of different company. But

whatever may have been the causes of his celebrity, it has come to him, as all accounts agree, unsought for by himself. He has certainly many excellent qualities: humane and charitable to the highest degree, he not only furnishes the indigent peasants who consult him, with medicines gratis, but generally makes them a present in money besides, and he always appropriates a certain portion of his gains to the poor of his parish. His wife and grand-daughters are dressed like the peasant women of the country; and he has shown his good sense in giving to the latter a plain education: the eldest he bestowed in marriage, when she was but fifteen, upon one of his assistants, and with her L. 1,300; no inconsiderable portion for this country. He procured a match for her so early, he said, to prevent her being spoiled by the young gentlemen telling her that she was pretty, and inspiring her with the ambition of marrying above her rank.

If domestic harmony, and the most perfect simplicity of manners, have any pretensions to please, you would be highly delighted with this rural family. The wife is a notable active woman, and superintends the household affairs with remarkable cleverness: she assists her husband likewise in preparing his medicines; and, as he talks no other language than the German, she serves occasionally as his interpreter. As a proof of his confidence in her administration of his affairs, she acts also as his treasurer, and receives all fees; which, in the course of a year, amount to a considerable sum: for, although he never demands more than the price of his medicines, yet no gentleman consults him without giving an

additional gratuity. She has likewise received many presents from persons who have reaped benefit by her husband's prescriptions: several of these presents consist of valuable trinkets, with which on days of ceremony she decks herself to the best advantage, in the simple dress of the country.

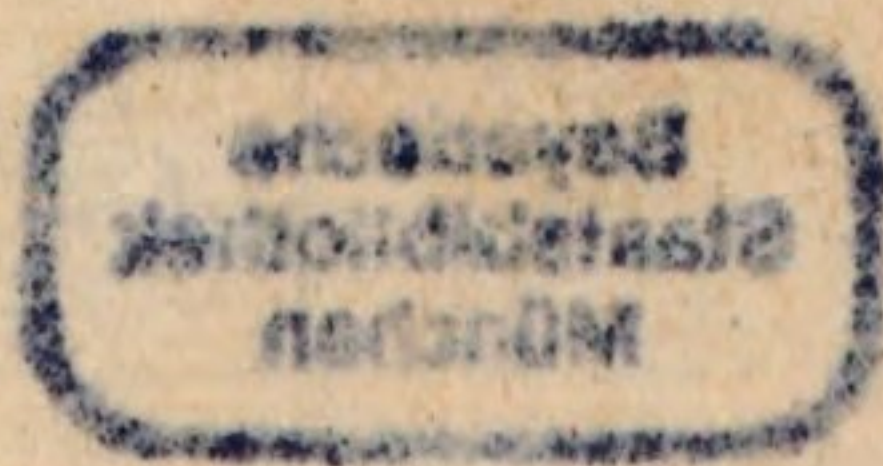
The family sit down to table regularly at twelve o'clock: there are always some strangers of the party: consisting not only of those persons who are under the doctor's care, but of travellers, like ourselves, who are led by motives of mere curiosity. When the weather is fine, and their guests more numerous than usual, dinner is served in an open shed, that overlooks the adjacent country, with a distant view of the glaciers beyond the lake of Thun. Yesterday some peasants, whom the doctor had invited, formed part of our company; after dinner, he gave some money to those that sat near him, and ordered one of his grand-daughters to distribute his bounty to the others. The benevolence of the old man, his gaiety and good-humor, the cheerfulness of his family, the gratitude of the poor peasants, the beauty of the prospect, and the fineness of the weather, formed all together a most agreeable and delightful scene; and I do not remember to have ever partaken of any meal with a more sensible and heart-felt satisfaction.

This singular man is very often employed in giving advice from eight in the morning till six in the evening, with no other intermission than during the time he is at table. His drugs are of the best kind; for he collects the simples,
and

and distils them himself. His house, like those of the peasants, is constructed of wood; and, though always full of people, is remarkably neat and clean. In short, every thing about him bears the appearance of the pleasing simplicity of former ages.

I had almost forgotten to tell you, that I consulted him this morning; and have reason to be highly satisfied with his prescription: for, he told me I was in such good health, that the only advice he had to give me, was “to eat and “drink well, to dance, be merry, and take “moderate exercise.”

It is now Langnau fair; and the village is crowded with the neighbouring peasants. Great numbers of the men have long beards, and many of them cover their heads with a woman's straw-hat, extremely broad, which makes a very grotesque appearance: their dress is chiefly a coarse brown cloth jacket without sleeves; with large puffed breeches of ticking. The women, who are remarkably handsome, wear their hair plaited behind in tresses, with the ribbands hanging down below the waist; a flat plain straw-hat, which is very becoming; a red or brown cloth jacket without sleeves; a black or blue petticoat bordered with red, and scarcely reaching below the knees; red stockings with black clocks, and no heels to their shoes; their shifts of extremely fine linen, fastened close round the throat by a black collar with red ornaments: the better sort have chains of silver between the shoulders, brought round under each arm, and fastened beneath the bosom, the ends hanging down with some silver ornaments.



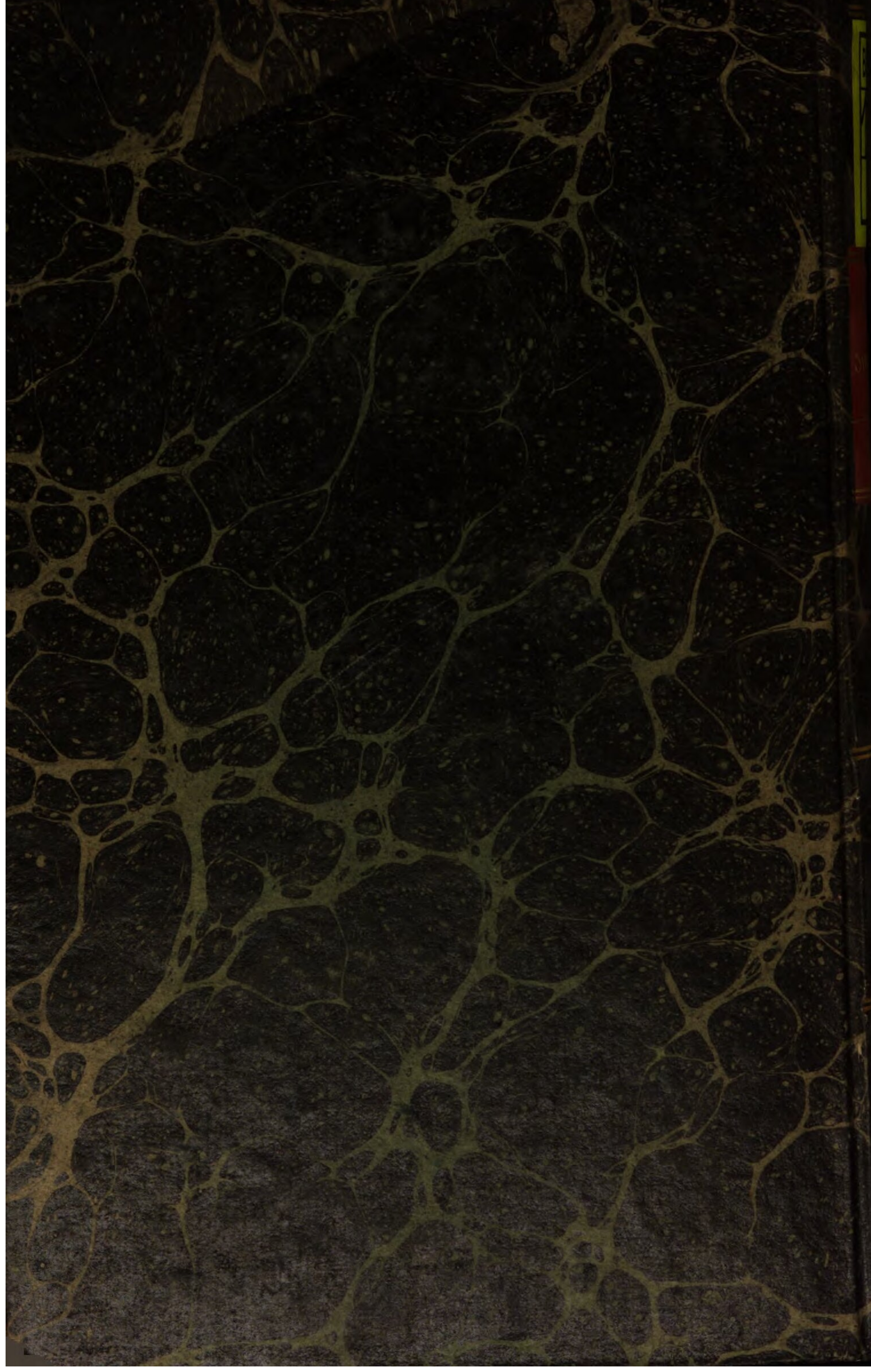
I am so charmed with the situation of this village, the cheerfulness and singularity of this rustic and agreeable family, and the uncommon character of the humane doctor, that I could with pleasure continue here some days longer; but I am pressed for time, and have a long journey before me.

POSTSCRIPT.

THIS celebrated empiric died in March 1781; and Langnau, which I again visited in August 1786, was no longer the resort of the sick, the valetudinarian, the curious, and the idle. The doctor had gained by his practice L. 10,000; of which sum his wife received a third, and the remainder was distributed among his son-in-law and grand-children.

Langnau is situated at the commencement of the Emmethal, a valley remarkable for its cultivation and beauty. Many of the farmers are extremely rich: the people appear in general contented and happy; the wooden cottages scattered about the fields, are uncommonly neat and comfortable, and announce, in their general appearance, the well-being of the peasantry.

END OF THE SECOND VOLUME.



Coxe, William, / Ramond, Louis-François, / Birman, Samuel,

Travels in Switzerland and in the country of the Grisons

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